Vol. 908 Number 4

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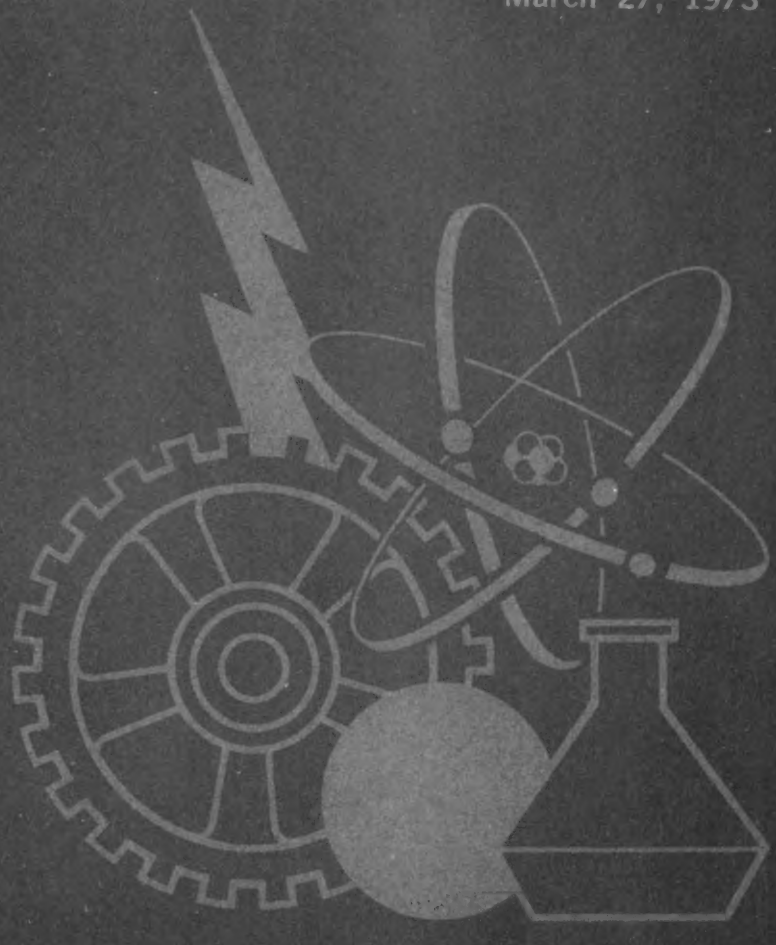
PATENTS

March 27, 1973



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

March 27, 1973 Volume 908 Number 4

CONTENTS

Page

Patents and Trademark Notices

Withdrawal of Proposed Rule Making Regarding Placing of Announcements 784

Patent Suits 784

Patent Notices

Certificates of Correction for the Week of February 27, 1973 786

Disclaimer 786

Adverse Decisions in Interferences 786

Certificates of Correction for the Week of March 27, 1973 786

Condition of Patent Applications 787

Defensive Publications 788

Patents Granted

General and Mechanical 791

Chemical 1064

Electrical 1168

Design Patents Granted 1261

Index of Patentees . . . . . PI 1

Indices of Applicants of Defensive Publications and Designs . . . . . PI 60

Classification of

Patents . . . . . PI 63

Designs and Defensive Publications . . . . . PI 67

Geographical Index of Residence of Inventors

Patents . . . . . PI 68

Designs and Applicants of Defensive Publications . . . . . PI 70

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PATENT OFFICE NOTICES

Legal Journals

[37 CFR Parts 1, 2]

Withdrawal of Proposed Rule Making Regarding Placing of Announcements

Under date of May 11, 1972, 37 FR 9488 (FR Doc. 72–7160), notice of proposed rule making was given concerning a proposed revision of §§ 1.345(b) and 2.14(b) of Title 37 of the Code of Federal Regulations. The purpose of the proposed revision was to permit persons practicing before the Patent Office to place in legal journals announcements of their availability to act as consultants to or as associates of other lawyers in patent or trademark practice. After careful consideration of all of the comments received on the proposed revision, it has been determined that the proposed revision will not be made at this time and, accordingly, the notice of proposed rule making is canceled and withdrawn.

Dated: Jan. 29, 1973.

ROBERT GOTTSCHALK,
Commissioner of Patents.

Approved: Jan. 29, 1973.

RICHARD O. SIMPSON,
Acting Assistant Secretary for Science and Technology.

[FR Doc. 73–3097; Filed 2–15–73; 8:45 am]

Published in 38 F.R. 32; Feb. 16, 1973

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

906,827, E. G. Staude, FEED DEVICE FOR FLEXIBLE BOX MAKING MACHINES; **3,285,602,** P.H. Hartel, RECORD CARD FEED MECHANISM; **3,588,095,** Ward, Ward and Bachmann, SUCTION TABLE SYSTEM FOR FEEDING OF WARPED SHEETS, **filed** July 20, 1972, D.C.N.J. (Camden), Doc. C–1256–72, *The Ward Machinery Company* v. *The Langston Company.*

2,678,625, Hall and Teichmann, RESONANT SOUND SIGNAL DEVICE, **filed** in U.S. Court of Appeals, Sixth Circuit, Doc. 71–1518–19, *Clyde M. Noll and S. Joseph Fortunato, as trustees* v. *the O. M. Scott & Sons Company.* Claim in issue is invalid, and judgment of the District Court should be affirmed for the reasons set forth in the opinion of Judge Kinneary, Sept. 27, 1972.

2,772,509, C. L. Vadnais, ATTACHMENTS FOR FISHING LINES, **filed** Oct. 2, 1972, D.C. Oreg. (Portland), Doc. 72–827, *Water Gremlin Company* v. *Maxwell Mfg. Co.*

2,811,946, N. Marforio, LOOPER CONTROL FOR SEWING MACHINES, **filed** Aug. 13, 1971, D.C., N.D. Ga. (Atlanta), Doc. 15508, *S.p.A. Virginio Rimoldi & Co.* v. *Sunbrand Corporation and Wilcox & Gibbs, Inc.* Consent dismissal under Rule 41(a)(1)(ii), Sept. 11, 1972.

2,841,124, H. S. Ackerman, MIDGET GAS FIRED HOT WATER BOILER; **3,320,933,** J. F. Baier, GAS FIRED HOT WATER BOILER, **filed** Apr. 12, 1972, D.C.N.J. (Newark), Doc. 656–72, *Automation Industries, Inc. et al.* v. *John F. Baier et al.* Stipulation of dismissal, May 23, 1972.

2,984,841, N. E. Wilson, TOILET BOWL DEODORIZERS AND HOLDERS THEREFOR, **filed** Sept. 21, 1972, D.C., S.D. Ind. (Evansville), Doc. EV 72–C–72, *The Puro Co., Inc.* v. *E. Bierhaus & Sons, Inc. et al.*

3,029,291, A. J. Dietzler, METHOD FOR MAKING ALKYLIDENEBIS (DIBROMOPHENOLS), **filed** Oct. 16, 1972, D.C. Del. (Wilmington), Doc. 4486, *The Dow Chemical Corporation* v. *Great Lakes Chemical Corporation.*

3,651,777, J. H. Lemelson, MAGNETIC RECORDING SYSTEMS, **filed** Sept. 28, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2425, *Jerome H. Lemelson* v. *Ampex Corporation.*

3,061,332, L. S. Goulden, CARGO TRANSPORT ASSEMBLY, **filed** Sept. 3, 1971, D.C., M.D. Ala. (Montgomery), Doc. 1174–S, *Leo S. Goulden* v. *Dorsey Trailers, Inc.* Upon consideration of stipulation of parties for dismissal, order entered Sept. 28, 1972, dismissing case with prejudice, Oct. 5, 1972.

3,091,912, Stoddard and Seem, METHOD OF PROCESSING STRETCH YARN AND YARNS PRODUCED THEREBY, **filed** Oct. 12, 1972, D.C., S.D. Fla. (Miami), Doc. 72–1630–C–JE, *Lex-Tex Ltd., Inc.* v. *Richard J. Traub.*

3,103,666, A. R. Bone, TAG ATTACHING APPARATUS, **filed** Sept. 8, 1972, D.C. Hawaii (Honolulu), Doc. C–72–3642, *Dennison Mfg. Co.* v. *Halmac, Inc. et al.* Adjudged patent owned by plaintiff, valid and infringed by defendants. Plaintiff granted permanent injunction prohibiting defendants from infringing on same, Oct. 13, 1972.

3,110,905, T. M. Rhodes, TUFTED PILE FABRIC COMPRISING A FLAT WOVEN SYNTHETIC PLASTIC BACKING, **filed** Sept. 29, 1972, D.C. Md. (Baltimore), Doc. 72–1014–K, *Burlington Industries, Inc.* v. *Enjay Chemical Company, Inc.*

3,151,503, Keller and Keller, TRANSMISSION SYSTEM; **3,231,117,** Melroe and Keller, TRACTOR VEHICLE AND DRIVE THEREFOR; **D. 195,254,** Keller, Keller and Melroe, SELF-PROPELLED LOADER, **filed** Oct. 10, 1972, D.C., W.D. Mich. (Kalamazoo), Doc. K107–72CA–8, *Clark Equipment Co.* v. *Louis J. Keller and Cyril N. Keller.*

3,166,854, Packer and Benedetto, PLEAT-MARKING DEVICE; **3,306,603,** D. F. Ziers, HOLDING APPARATUS FOR SHEET MATERIAL, **filed** Sept. 20, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72–661–C, *Lightron Corp.* v. *George Callas.*

3,174,076, M. A. Michalski, ELECTRICAL SYSTEM FOR DISCHARGE DEVICE UTILIZING RESONANT CIRCUIT TO PROVIDE CONSTANT CURRENT OUTPUT; **3,309,566,** same, ELECTRICAL SYSTEM FOR GAS DISCHARGE LAMP; **3,309,567,** Flieder and Michalski, PULSE DISCHARGE LAMP CIRCUIT, **filed** Aug. 2, 1972, D.C., S.D.N.Y., Doc. 72–C–3282, *Berkey Photo, Inc.* v. *Klimsch-Kepro, Inc.*

3,206,028, Brauchla and Ruminsky, VIBRATORY SIZING APPARATUS, **filed** June 16, 1972, D.C., S.D. W. Va. (Huntington), Doc. 3003, *R. Lee Fraser* v. *Continental Realty Corp. et al.* Memorandum order; not infringed. Action dismissed, Sept. 22, 1972.

3,209,066, W. H. Toomey et al., PRINTED CIRCUIT WITH INTEGRAL WELDING TUBELETS; **3,256,586,** R. R. Douglas et al., WELDED CIRCUIT BOARD TECHNIQUE; **3,345,741,** W. G. Reimann, WELDABLE PRINTED CIRCUIT BOARD TECHNIQUES; **3,434,208,** W. H. Toomey et al., CIRCUIT ASSEMBLY PROCESS; **3,469,019,** W. G. Reimann, WELDABLE PRINTED CIRCUIT BOARD, **filed** June 1, 1972, D.C., United States Court of Claims, Doc. 232–72, *William H. Toomey et al.* v. *The United States.*

3,231,117. (See 3,151,503.)

3,239,145, A. D. Russo, DISPENSING CONTAINER FOR AIR TREATING GEL, **filed** July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1748 AAH, *Blue Cross Laboratories* v. *Airwick Industries, Inc.*

3,256,586. (See 3,209,066.)

3,282,469, A. W. Skonberg, HEATED DISPENSING APPARATUS, **filed** Oct. 4, 1972, D.C., S.D. Ind. (Evansville), Doc. NA 72–C–51, *Albert W. Skonberg* v. *Whirlpool Corporation.*

3,285,602. (See 906,827.)

3,294,082, J. W. Norris, SERPENTINE-TYPE HEAT EXCHANGE ASSEMBLY, **filed** Sept. 29, 1972, D.C., E.D. Ill. (Danville), Doc. CV 72–196–D, *Lennox Industries* v. *Lear Siegler, Inc*

3,298,550, B. D. Schiltz, HAYSTACK TRANSPORTING DEVICE, **filed** July 15, 1968, D.C. S. Dak. (Sioux Falls), Doc. C–68–10N, *Farmhand, Inc.* v. *Russell O. Craven, doing business as Craven Welding Co.* Decision entered Mar. 29, 1971, by Judge Axel J. Beck, Aberdeen, S. Dak. in favor of the defendant. Judgment was appealed and reversed for new trial. Mandate entered Apr. 7, 1972.

3,306,603. (See 3,166,854.)

3,309,566. (See 3,174,076.)

3,309,567. (See 3,174,076.)

3,320,933. (See 2,841,124.)

3,341,247, W. W. Martinmaas, TRACTOR CAB, filed Oct. 14, 1969, D.C. S. Dak. (Sioux Falls), Doc. C-69-150S, *Donald F. Johnson, doing business as Johnson Tractor Cab Company v. Werner W. Martinmaas, Koehn Mfg., Inc., Lange Mfg., Inc., and Comfort Equipment Company.* Case Dismissed as to defendants Koehn Mfg. and Comfort Equipment Company. No decision rendered or judgment entered as to remaining defendants, Oct. 11, 1972.

3,345,741. (See 3,209,066.)

3,390,533, G. S. Gremillion, MACHINE FOR LAYING CABLE AND THE LIKE, filed May 13, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1128, *John T. Jursich v. J. I. Case Company.* Judgment in favor of the defendant, J. I. Case Company, Oct. 5, 1972.

3,434,208. (See 3,209,066.)

3,469,019. (See 3,209,066.)

3,478,700, Lundvall, Loomis and Breen, FLOOR LATCH STRIP FOR RAILWAY CARS, filed Oct. 4, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2492, *Unarco Industries, Inc. v. Evans Products Company et al.*

3,575,678, W. F. Barton, REED SWITCH ASSEMBLY, filed Oct. 10, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2472, *Grigsby Barton, Inc. v. C.P. Clare & Company et al.*

3,588,019, Cozeck, Otero and Pierce, BRACKET FOR ELECTRICAL BOXES, filed Oct. 3, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72-2342-DWW, *Anthony J. Cozeck v. Michel Brothers, Inc. et al.*

3,588,095. (See 906,827.)

3,613,797, WHITFIELD AND WHITESIDES, PEANUT DIGGER, SHAKER AND INVERTER, filed Sept. 19, 1972, D.C., E.D.N.C. (Wilson), Doc. 1295-C, *Kelley Mfg. Co. v. Lilliston Corporation.*

3,616,356, C. H. Roy, ELECTROLYSIS IN A PARTICULATE CARBON PACKING, filed Oct. 13, 1972, D.C. Conn. (New Haven), Doc. 15382, *Clarence H. Roy v. Microtech Division of Waveline, Inc.*

3,663,233, J. L. Keszler, METHOD OF TENDERIZING, CURING AND COOKING A MEAT PRODUCT, filed Oct. 11, 1972, D.C. Conn. (New Haven), Doc. 15378, *Julius L. Keszler v. K-T Corporation and Keszler Corporation.*

3,675,655, W. R. Sittner, METHOD AND APPARATUS FOR HIGH FREQUENCY ELECTRIC SURGERY, filed Sept. 19, 1972, D.C. Colo. (Denver), Doc. C-4340, *Electro Medical Systems, Inc. v. Valleylab, Inc.*

Re. 25,787, W. E. Brainard et al., MACHINE TOOL WITH MECHANICAL CUTTING TOOL CHANGER, filed Sept. 15, 1970, D.C., E.D. Mich. (Detroit), Doc. 35374, *Ex-Cell-O Corp. v. Kearney & Trecker Corporation.* Stipulation and order of dismissal without prejudice, Sept. 21, 1972.

D. 195,254. (See 3,151,503.)

Certificates of Correction for the Week of Feb. 27, 1973

D. 220,242	3,651,154	3,668,708
3,571,954	3,651,792	3,668,727
3,575,795	3,652,133	3,669,266
3,575,911	3,652,309	3,669,901
3,581,512	3,653,262	3,669,963
3,585,006	3,653,653	3,670,008
3,588,828	3,653,932	3,671,114
3,602,400	3,657,041	3,671,525
3,614,727	3,658,478	3,671,651
3,616,189	3,658,548	3,672,707
3,616,322	3,658,813	3,672,877
3,622,991	3,658,919	3,672,930
3,624,206	3,658,992	3,673,233
3,627,996	3,660,087	3,674,124
3,630,693	3,660,697	3,674,494
3,631,257	3,661,562	3,675,777
3,636,333	3,661,694	3,675,899
3,638,137	3,661,893	3,676,023
3,639,211	3,662,965	3,678,459
3,641,012	3,663,628	3,678,463
3,642,094	3,663,665	3,679,345
3,644,881	3,665,427	3,682,281
3,646,103	3,665,846	3,685,353
3,646,587	3,667,810	
3,649,249	3,668,132	

Disclaimer

3,600,705.—*Wirojana Tantraporn* and *Se Puan Yu*, Schenectady, and *Paul J. Shaver*, Scotia, N.Y. HIGHLY EFFICIENT SUBCRITICALLY DOPED ELECTRON-TRANSFER EFFECT DEVICES. Patent dated Aug. 17, 1971. Disclaimer filed Dec. 29, 1972, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claim 22 of said patent.

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,337,482, H. Watanabe, S. Takahashi, A. Shingyochi and N. Watanabe, ETHYLENE-VINYL ACETATE COPOLYMER PAPER COATING COMPOSITION, decided June 9, 1972, Interference No. 96,627, claims 1, 2, 3, 4, 5, 7 and 11.

Patent No. 3,417,842, J. H. Kuzara and O. J. Martin, ELEVATOR CONTROLS, decided Nov. 3, 1970, Interference No. 97,247, claims 1, 2, 3, 4, 5 and 6.

Patent No. 3,419,569, U. Renner, INDOLE DERIVATIVES, decided Oct. 10, 1972, Interference No. 97,270, claim 9.

Patent No. 3,455,723, E. L. Kern, COATING WITH SILICON CARBIDE BY IMMERSION REACTION, decided Feb. 7, 1973, Interference No. 98,012, claims 1 and 3.

Patent No. 3,478,667, P. A. Bourquin, TOP DISCHARGE AIR DUCT SYSTEM AND AIR DUCTS THEREFOR, decided Jan. 16, 1973, Interference No. 97,807, claims 1, 3 and 13.

Patent No. 3,481,926, G. A. Hippi and J. B. Siddall, POLYHYDROXY STEROIDS AND PROCESSES FOR THEIR PREPARATION, decided Sept. 25, 1972, Interference No. 97,236, claim 11.

Patent No. 3,560,200, E. A. Nesbitt, J. H. Wernick and R. H. Willens, PERMANENT MAGNETIC MATERIALS, decided Feb. 8, 1973, Interference No. 97,836, claim 2.

Certificates of Correction for the Week of Mar. 27, 1973

Re. 27,464	3,657,223	3,676,338	3,687,709
3,550,158	3,657,325	3,676,504	3,687,785
3,552,987	3,658,043	3,676,548	3,687,882
3,536,301	3,658,538	3,676,718	3,687,991
3,568,252	3,658,579	3,676,867	3,688,002
3,569,782	3,658,842	3,677,034	3,688,068
3,573,470	3,659,074	3,677,050	3,688,091
3,575,896	3,660,364	3,677,116	3,688,749
3,576,019	3,660,398	3,677,208	3,688,882
3,578,257	3,660,466	3,677,423	3,689,020
3,589,509	3,660,487	3,678,105	3,689,592
3,597,245	3,660,523	3,678,340	3,689,658
3,600,145	3,660,754	3,679,159	3,689,778
3,601,546	3,660,821	3,679,741	3,689,827
3,603,209	3,661,565	3,679,749	3,690,103
3,603,597	3,661,697	3,679,795	3,690,194
3,612,286	3,661,908	3,679,962	3,690,218
3,616,163	3,661,957	3,679,978	3,690,316
3,617,136	3,662,059	3,680,345	3,690,469
3,617,715	3,662,540	3,680,456	3,690,514
3,619,341	3,663,338	3,681,105	3,690,574
3,619,342	3,663,448	3,681,244	3,690,641
3,625,796	3,665,784	3,681,394	3,691,338
3,630,992	3,665,994	3,681,401	3,691,967
3,632,572	3,667,922	3,681,415	3,692,358
3,633,612	3,667,989	3,681,423	3,693,006
3,633,828	3,668,074	3,681,455	3,693,298
3,637,385	3,668,177	3,682,030	3,693,317
3,637,697	3,668,205	3,682,980	3,693,697
3,637,840	3,668,209	3,683,034	3,694,117
3,640,724	3,668,618	3,683,053	3,694,657
3,640,853	3,668,619	3,683,122	3,694,667
3,641,038	3,669,689	3,683,910	3,695,234
3,642,848	3,670,865	3,683,979	3,695,369
3,642,937	3,670,956	3,684,378	3,695,598
3,644,364	3,671,328	3,684,538	3,696,467
3,644,558	3,671,603	3,684,576	3,696,831
3,644,831	3,671,644	3,684,654	3,697,370
3,646,274	3,671,908	3,684,809	3,697,497
3,646,608	3,672,264	3,684,886	3,698,228
3,647,566	3,672,371	3,685,084	3,698,786
3,648,241	3,672,904	3,685,284	3,699,182
3,649,696	3,672,928	3,685,305	3,699,710
3,650,949	3,672,988	3,685,319	3,699,735
3,651,003	3,673,015	3,686,190	3,700,768
3,651,105	3,673,320	3,686,291	3,701,417
3,652,221	3,674,863	3,686,323	3,702,825
3,652,315	3,675,172	3,686,599	3,703,383
3,652,469	3,675,703	3,686,950	3,705,629
3,653,933	3,675,724	3,686,983	3,705,773
3,655,569	3,675,931	3,687,201	
3,656,971	3,676,006	3,687,546	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 6, 1973

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-16-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-03-72
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	11-16-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	12-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-02-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-18-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-31-72
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	4-19-72
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-15-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-04-72
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	5-26-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-17-72
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus: Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-03-72
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	4-10-72
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-06-72
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-03-72

Expiration of patents: The patents within the range of numbers indicated below expire during March 1973, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,736,898 to 2,740,116, inclusive
Plant Patents..... Numbers 1,457 to 1,466, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED MARCH 27, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

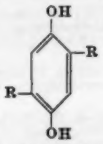
Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T908,001
INHIBITING POLYMERIZATION OF ACRYLIC AND METHACRYLIC ACIDS AND ESTERS THEREOF

John E. Besser, 4422 Harbor Drive, Kingsport, Tenn. 37662

Filed Feb. 14, 1971, Ser. No. 118,506
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R
No Drawing. 12 Pages Specification

Undesired polymerization of acrylic and methacrylic acids and esters thereof can be prevented by adding thereto from about 200 to about 20,000 parts per million by weight of at least one 2,5-di-substituted alkylhydroquinone having the general formula:

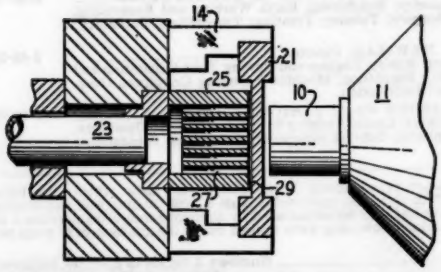


wherein R is an alkyl radical of from four to five carbon atoms. The 2,5-di-substituted alkylhydroquinone may be added either directly to the acrylic and methacrylic acids and esters thereof or to the reaction mixture from which the acids and esters are prepared. When these substituted alkylhydroquinones are added to the reaction mixture it has been found that they not only effectively prevent polymerization of the acid or ester during the synthesis process, but also remain in the synthesized products thereby effectively inhibiting their polymerization during storage. The substituted alkylhydroquinones polymerization inhibitors of this invention do not contribute any undesirable color or in any way interfere with successful subsequent processing of the acids or esters into any desired ultimate product.

T908,002
METHOD OF BONDING A MEMBER TO A THIN PLATE

Calvin D. Loyd, 5029 Melody Lane, Peoria, Ill. 61604

Filed June 1, 1971, Ser. No. 148,343
Int. Cl. B23k *27/00*
U.S. Cl. 29—470.3
2 Sheets Drawing. 10 Pages Specification



Method of friction bonding a thick section member to a thin section member, such as a thin plate or sheet, wherein a heat conductor is applied to one side of the thin section member for cooling purposes while the other side of said member heats to bonding temperature along with the mating surface of the larger section member.

The heat conductor may be a block of high heat conducting material, a perforated member having a fluid coolant flowing therethrough, a member which directs a flow of fluid coolant against the backside of the thin section member, or a member having a low melting point. The member having a low melting point is held in contact with the thin section member by a ram and surrounded by a floating sleeve which is also urged against the thin section member and has an end slotted whereby, when the heat conducting member having a low melting point melts, the melted material flows radially outwardly through the slots and the ram continues to force the member into contact with the workpiece where it continues to melt, cooling the workpiece by the heat of fusion.

T908,003
PROCESS FOR STABILIZED POLYETHERS

Michael Kokorudz, 17994 Parke Lane, Grosse Ile, Mich. 48138

Filed June 21, 1971, Ser. No. 155,329
Int. Cl. C07c *43/30*
U.S. Cl. 260—615 A
No Drawing. 8 Pages Specification

The process for preparing hydroxyl terminated polyalkylene polyethers stabilized by conversion to acetals through reaction with alphahaloalkyl alkyl ethers is improved by heat treating the acetals in the presence of an alkali carbonate to eliminate free hydrohalide acid and oxonium hydrogen halide.

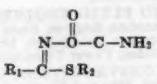
T908,004
PREPARATION OF THIOLHYDROXAMATE CARBAMATES

Earl W. Cummins, Oak Lane Manor, 2410 Shellpot Drive, Wilmington, Del. 19803

Continuation of application Ser. No. 872,725, Oct. 30, 1969. This application Oct. 7, 1971, Ser. No. 187,549
Int. Cl. C07c *119/00*
U.S. Cl. 260—453 R
No Drawing. 15 Pages Specification

In the preparation of thiolhydroxamate carbamates of the formula:

(1)



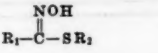
wherein

R_1 is methyl, ethyl, methoxymethyl or (methylthio) methyl; and

R_2 is methyl, ethyl or propyl;

by reaction of a thiolhydroxamate ester of the formula:

(2)



with isocyanic acid in an aqueous medium optionally containing up to 50% of a nonreactive organic liquid, at a temperature between the freezing point and boiling point of the reaction mass (usually between −15° C. and 80° C.), improved yields are obtained by maintaining the pH between 1.5 and 5.0, preferably between 2.5 and 4.5, most preferably between 3.5 and 4.0. The isocyanic acid can be generated in situ by concurrent addition of an alkali metal cyanate such as sodium cyanate and a mineral acid such as H_2SO_4 to the reaction mass.

T908,005

CONTROL OF PLANT PARASITIC NEMATODES WITH 2-BENZIMIDAZOLE-CARBAMIC ACID, METHYL ESTER

Edward J. Soboczenski, R.D. 1, Chadds Ford, Pa.

Filed Oct. 27, 1971, Ser. No. 193,167
Int. Cl. A01n *9/22*
U.S. Cl. 424—273
No Drawing. 5 Pages Specification

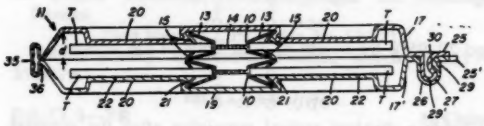
The compound 2-benzimidazolecarbamic acid, methyl ester is useful for the control of plant parasitic nematodes. Thus when the compound is applied to soil, to seeds, to foliage, or to the nematodes at rates of .05 to 50 kilograms/hectare or .05 to 2.0% by weight of the seeds, plant parasitic nematodes such as the dagger, cyst, needle, stubby root, and bud and leaf nematodes are controlled.

T908,006

PACKAGE FOR TRANSPARENCY SLIDES

Arthur C. Rissberger, Jr., Webster, and George J. Richards and Adrian C. Runions, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,252
Int. Cl. G09f *15/00*
U.S. Cl. 40—106.1
1 Sheet Drawing. 21 Pages Specification



A package for returning a customer's processed and slide mounted transparencies which, in addition to protecting the slides against damage and dust during shipment, can be used as a viewer and/or as an editor for the slides. The package comprises a slide stick on which a plurality of slides are held by their edges in side-by-side relation and a hinged receptacle or wallet in which the sticks of slides are releasably retained with the slides lying flat in each side of the receptacle. The receptacle is made of transparent or translucent plastic which allows the slides to be viewed by transmitted and/or reflected light while in situ in the receptacle after the receptacle is hinged open.

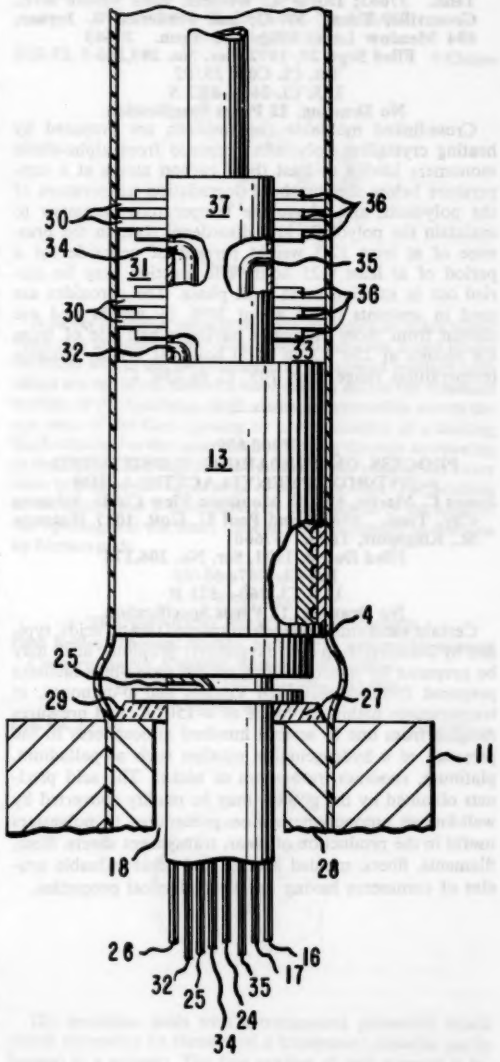
T908,007

PROCESS AND APPARATUS FOR EXTRUDING POLYOLEFINS

Edward Joseph Moore, Tonawanda, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 76,586, Sept. 29, 1970, which is a continuation of application Ser. No. 763,842, Sept. 30, 1968, both now abandoned. This application Nov. 10, 1971, Ser. No. 197,444
Int. Cl. B29d *7/20, 23/04*
U.S. Cl. 264—209
2 Sheets Drawing. 17 Pages Specification

A process for preparing tubular film structures of polyolefins which comprises melt-extruding a polyolefin polymeric material in tubular form; advancing the tubular film at a predetermined rate first over a liquid coolant medium disposed internally of such film while maintaining the liquid coolant under pressure without rupturing the film, and then over quenching means for cooling the film to a temperature below its formative state, the liquid coolant medium completely filling a space between and defined by a die member for melt-extruding the tubular film, the inner surface of the tubular film and the quenching means, the liquid coolant medium having a boiling point greater than the temperature of the die member.



The liquid coolant is polyethylene glycol, ethylene glycol, or glycerol which is disposed in a space between a

die member and the quenching means and the space is maintained substantially full of the liquid coolant which has a temperature in the range between 10° C. and 45° C. The surface of the die member facing the space between the die member and the quenching means is insulated with an annular insulating tapered disc coextensive with the die core of the die member whereby contact between said liquid coolant medium and the die member is minimized and whereby contact between the disc and the inside surface of the tubular film advanced thereby also is minimized.

T908,008
CROSS-LINKED POLYOLEFINS

Richard L. McConnell, 421 Manderly Road, Kingsport, Tenn. 37663; Doyle A. Weemes, 1603 Moore Ave., Greenville, Tenn. 37743; and Frederick B. Joyner, 404 Meadow Lane, Kingsport, Tenn. 37663

Filed Sept. 28, 1972, Ser. No. 293,263
Int. Cl. C08f *29/02*
U.S. Cl. 260—88.2 S
No Drawing. 12 Pages Specification

Cross-linked moldable compositions are prepared by heating crystalline polyolefin prepared from alpha-olefin monomers having at least three carbon atoms at a temperature below the threshold degradation temperature of the polyolefin and above the temperature necessary to maintain the polyolefin in a disordered state in the presence of at least 12.5 weight percent of peroxide for a period of at least 0.25 hour. The reaction may be carried out in solution or in melt phase. The peroxides are used in amounts up to about 30% by weight and are chosen from those peroxides having a half life of from 0.6 second at 250° C. to 1000 hours at 80° C. Suitable temperatures range from 105° C. to 250° C.

T908,009
PROCESS OF PREPARING SUBSTITUTED p-(HYDROXYPHENYL) ACETIC ACIDS

James C. Martin, 601 N. Mountain View Circle, Johnson City, Tenn. 37601, and Paul G. Gott, 1017 Watauga St., Kingsport, Tenn. 37660

Filed Dec. 8, 1971, Ser. No. 206,178
Int. Cl. C07c *65/02*
U.S. Cl. 260—521 R
No Drawing. 12 Pages Specification

Certain substituted p-(hydroxyphenyl)acetic acids, typified by 2-methyl-2-(p-hydroxyphenyl) propionic acid, may be prepared by hydrogenation of the mono-beta-lactones prepared from disubstituted ketenes and p-quinones, at temperatures within the range of 0–150° C. and pressures ranging from one to several hundred atmospheres in the presence of a hydrogenation catalyst such as palladium, platinum, rhodium, ruthenium or nickel. The acid products obtained by the process may be readily converted by well-known autopolymerization procedures to polyesters useful in the production of clear, transparent sheets, films, filaments, fibers, molded articles and other valuable articles of commerce having excellent physical properties.

T908,010
PROCESS FOR CURING EPOXY RESIN LAMINATES IN INERT HOT LIQUID MEDIUM

James E. Carey, Twin Lakes Drive, Mantua, N.J. 08051; Robert C. Breitel, 3901 Parkview Lane, Apt. 8B, Irvine, Calif. 92664; and Robert J. Moore, 12315 Longworth Lane, Bunker Hill, Houston, Tex. 77024

Filed Dec. 13, 1971, Ser. No. 207,653
Int. Cl. B05c *3/12*; B44d *1/098, 1/46*
U.S. Cl. 117—119.6
No Drawing. 18 Pages Specification

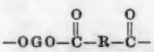
Glass fiber bundles, glass mat or glass cloth reinforced plastic laminates having improved water resistance and electrical properties are prepared by first impregnating fiber bundles, mats or cloth with a solventless mixture of a liquid polymeric resin such as an epoxy resin and a curing agent therefor and then immersing the product in a hot, non-solvent, liquid bath (silicone oil, molten aliphatic wax) to effect polymerization and cure of the resin.

T908,011
POLYISOCYANATE MODIFIED THERMOPLASTIC POLYESTER COMPOSITIONS

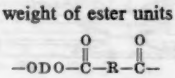
William Kenneth Witsiepe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1971, Ser. No. 209,424
Int. Cl. C08g *22/10, 22/48*
U.S. Cl. 260—75 NK
No Drawing. 28 Pages Specification

A modified polyester composition prepared by mixing a segmented copolyester polymer with about 2–50 milliequivalents per 100 g. of copolyester polymer of a polyisocyanate and subsequently contacting the resulting mixture with water, preferably by exposure to atmospheric water vapor. The initial copolyester has an inherent viscosity of at least about 0.75 at 30° C. in m-cresol and consists essentially of 5–80% by weight of ester units of the structure



and 20–95% by weight of ester units of the structure



G being a divalent radical remaining after the removal of terminal hydroxyl groups from a long chain glycol having a melting point below about 65° C. and a molecular weight of 600–6000, R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight of less than about 300, and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight of less than about 250. Useful polyisocyanates range from monomeric polyisocyanates such as toluene diisocyanate to isocyanato-terminated reaction products having an isocyanato group assay as low as 0.2%.

The modified polyester compositions are thermoplastic and exhibit tensile strength, permanent set, compression set, and flex resistance. They may be processed by procedures used for thermoplastics in general.

PATENTS

GRANTED MARCH 27, 1973

GENERAL AND MECHANICAL

3,721,992

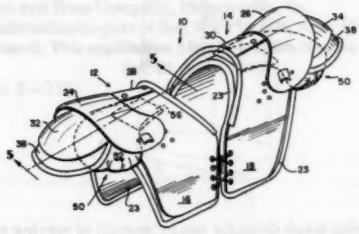
BRUISE PAD ATTACHMENT

Donald N. Ettinger, St. Louis, Mo., assignor to Hit-Away, Inc., Indianapolis, Ind.

Filed May 18, 1972, Ser. No. 254,768

Int. Cl. A41d *13/00*

U.S. Cl. 2—2 **11 Claims**



An inflatable bruise pad insert for protective gear such as cantilever type shoulder pads is held firmly in place adjacent to a gap which exists between the top and front portions of the shoulder pads. When partially inflated, the pad insert fills the gap and cushions blows to that region to prevent injuries to the wearer.

3,721,993

AUDITORY PROTECTION ON SAFETY HELMETS

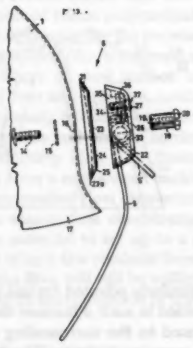
Bo Gunnar Lonnstedt, Kvarnbergsvagen 23, Huddinge, Sweden

Filed March 12, 1971, Ser. No. 123,712

Claims priority, application Sweden, March 19, 1970, 3786/70

Int. Cl. A42b *3/00*

U.S. Cl. 2—3 R **10 Claims**



The present invention relates to an arrangement for preventing auditory damage and keeping out irritating noises. It consists of ear muffs displaceable on clamps pivotably arranged with attachment units on a safety helmet. The invention is characterized mainly in that each attachment unit on the helmet is provided with, in addition to attaching means for pivotable attachment on the safety helmet, adjusting means acting on the clamp which is attached to the attachment unit on the helmet and determines the contact pressure. As a result, the ear muffs can be easily lifted off, even with a gloved hand, and swung up to a resting position on the safety helmet.

3,721,994

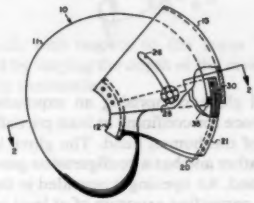
DUAL VISOR HEADGEAR

David N. DeSimone, and Frank A. Catroppa, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 29, 1971, Ser. No. 128,667

Int. Cl. A42b *3/00*

U.S. Cl. 2—6 **9 Claims**



A safety headgear open at the face including an outer tinted visor and an inner clear visor retained between arced tracks on either side of the face opening. In the stowed position both visors are retracted behind a visor canopy across the forehead section of the headgear. Both visors are extensible across the eye area of the face opening by a combination of a locking knob attached to the outer visor extending through an opening in the canopy and lugs formed on the upper edge of the outer visor to engage the upper edge of the inner visor. The position of the outer visor is determined by the position of the knob in the opening and the inner visor is retained simply in position by friction pads.

3,721,995

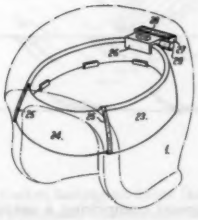
TRANSPARENT PROTECTIVE SCREEN

Paul Peillex, Thonon, France, assignor to Arisara Investment Corporation NV, Curacao, Netherlands Antilles

Filed April 12, 1971, Ser. No. 133,096

Int. Cl. A61f *9/04*

U.S. Cl. 2—10 **6 Claims**

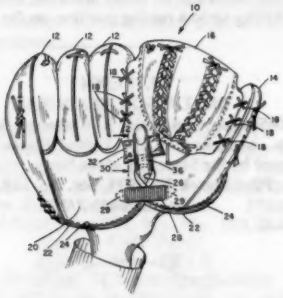


The invention deals with a transparent protective shield which comprises an element of a transparent material partly housed in a support. The free portion of said element is intended to be located in front of a sighting field. An actuating device drives the transparent element in displacement relative to the support so that it passes over scraping lips which clean said element.

3,721,996
BASEBALL GLOVE

Benjamin Nadorf, Dobbs Ferry, N.Y., assignor to Everlast World Boxing Headquarters Corp., Bronx, N.Y.

Filed July 16, 1971, Ser. No. 163,382
Int. Cl. A41d *13/08*
U.S. Cl. 2—19 9 Claims



A baseball glove comprising an exposable ball-receiving pouch and space for confining at least partially a human hand and fingers of the human hand. The glove is generally constituted of leather and has a configuration generally simulating the human hand. An opening is provided in the rear portion of the glove for permitting exposure of at least one of the fingers of the human hand relative to the space in which the remainder of the hand and fingers are confined. An elastic strip is provided for adjusting the effective extent of the edge of the rear portion which is most remote from the finger-simulating elements of the glove to thereby prevent the glove from slipping relative to both the human hand and those fingers confined therein. Moreover, the rear portion of the glove includes a resilient projection which is engageable by that finger of the human hand which is protrudable through the opening provided in the rear portion to further enhance the prevention of the glove from slipping relative to both the human hand and those fingers confined therein.

3,721,997
PROTECTIVE GARMENT

Trexie I. Mundt, Southfield, Mich., assignor to Sterling L. O'Dell, East Detroit, Mich., a part interest

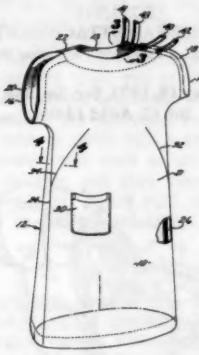
Filed July 17, 1972, Ser. No. 272,610
Int. Cl. A41d *27/12, 17/00*
U.S. Cl. 2—46 1 Claim

A protective garment comprising a seamless, transparent, plastic body of tubular design having gathered elastic loops at the opposite ends thereof. In one embodiment, the loops are of such size as to be worn about the waist and the length of the body is such as to extend along both the inside and the outside of a coat or other piece of feminine apparel to be protected. In another embodiment, the body is of such length as to be worn between the upper thigh and the ankle and the opposite ends thereof are provided with elastic loops of differing sizes, one end to be worn about the upper thigh and the other end to be worn about the ankle.

3,721,998
HOSPITAL SCRUB DRESS

Phyllis L. Meyers, 5235 Linwood Drive, Los Angeles, Calif.

Filed Nov. 28, 1969, Ser. No. 880,679
Int. Cl. A41d *1/22*
U.S. Cl. 2—74 1 Claim

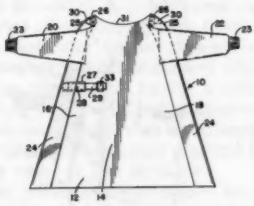


A hospital scrub dress for use by women of varying physical dimensions. The scrub dress is straight-sided without utilizing a waist line so as to obtain greater comfort and better lines for women of varying shapes. A boat neck is employed which will fit any size neck comfortably. Easy entry to the dress is made possible by a slit shoulder on one of the sleeves. The slit is closed by flat ties. The use of such flat ties permits easy laundering and ironing with a power mangle. The upper edges of the sleeves are open so as to permit freedom of arm movement.

3,721,999
SURGICAL GOWN AND METHOD OF FOLDING

Tamotsu Goya, Arlington Heights, and James E. Sill, Chicago, both of Ill., assignors to Cenco Medical Health Supply Corporation, Chicago, Ill.

Filed Jan. 24, 1972, Ser. No. 220,259
Int. Cl. A41b *9/00*; A61b *19/00*
U.S. Cl. 2—114 14 Claims



A gown particularly adapted for use in surgical and medical procedures, folded in such a manner that only its interior surfaces are exposed to the surrounding environment, assuring sterility of its exterior surfaces. The hands and arms of the wearer may be placed inside the sleeve portions of the gown prior to unfolding to move the gown from place to place without danger of accidental unfolding and consequent loss of sterility. Also disclosed is a process of folding a surgical gown having a body portion and integral sleeve portions by folding the body portion longitudinally toward the center; drawing said sleeve portions partially inside-out forming arm openings at their outer end and placing them parallel and adjacent one another along an axis substantially perpendicular to the longitudinal axis of the gown; folding the body portion upwardly

from its bottom in a plurality of sections; folding the section of the body portion underlying the parallel sleeve portions downwardly over the previously folded sections while tucking the collar points of the neck of the body portion under this section; folding the arm openings of the sleeve portions toward the center of the gown; and, finally, folding the gown in half at its center so that the arm openings face in the same direction.

3,722,000

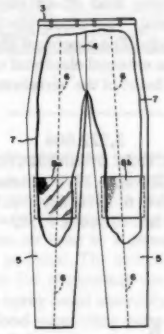
METHOD FOR REINFORCING TEXTILE GARMENTS WITH THERMOSETTING FILMS

Gary L. Rossell, Philadelphia; Paul C. Fleisher, Jr., Lafayette Hill, and Maurice I. Seifer, Levittown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 779,606, Nov. 27, 1968, abandoned. This application March 7, 1969, Ser. No. 805,359

Int. Cl. A41d *1/06*

U.S. Cl. 2—227 **8 Claims**



A process for reinforcing textile garments by forming a coherence of thermosetting or thermosettable reinforcing film in the fabric fibers of said garments at localized areas subject to severe stress is provided. The process is particularly applicable to permanent-crease slacks and like garments impregnated with a solution of resins polymerizable to a water-insoluble state and which provide for the permanent-crease. In the process, the thermosetting film is adhered and cohered to and with the surface fibers on one surface of the garment fabric by application of heat and pressure, cooled and the garment fabric is then optionally baked in an oven to polymerize the permanent crease resins and also to harden or post-cure the thermosetting reinforcing film. The thermosetting reinforcing film which may have a non-woven backing, used in the present invention has controlled flow characteristics and is so characterized that the appropriate combination of heat and pressure will cause the material to set up to a relatively rigid and non-flowable state after a few seconds thereby preventing bleeding through, but the flow will still be sufficient to provide for a good interlock and/or encapsulation of the thermosetting film and the fibers.

3,722,001

VARIABLE LENGTH TROUSERS CONSTRUCTION

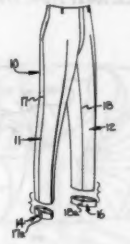
George Terrell Bailey, P.O. Box 271, Johnsonville, S.C.

Division of Ser. No. 836,268, June 25, 1969, Pat. No. 3,585,644. This application Jan. 14, 1971, Ser. No. 106,401

Int. Cl. A41d *27/00*

U.S. Cl. 2—269 **6 Claims**

A trousers construction including variable length, tubular trousers legs having a reversely extending fold inside the legs and a separately formed cuff detachably secured at the bottom edge portion of each trousers leg to permit varying the length of the cuffed trousers legs by upward and downward adjustment of the cuffs with respect to the lower edges of the trousers legs and by varying the depth of the reversely extending fold inside the trousers legs.



3,722,002

ACETABULAR SOCKETS

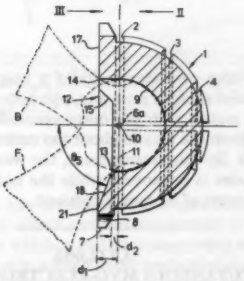
John Charnley, Hale, England, assignor to Chas. F. Thackray Limited, Leeds, Yorkshire, England

Filed Jan. 17, 1972, Ser. No. 218,443

Claims priority, application Great Britain, March 3, 1971, 5,891/71

Int. Cl. A61f *1/24*

U.S. Cl. 3—1 **11 Claims**



An acetabular socket having an inner face for receiving the head of a femoral prosthetic component, said inner face being of hemispherical shape extended by a part-cylindrical section of radius equal to the radius of the hemisphere, the axial length of a first circumferential part of the part-cylindrical section being greater than that of a second circumferential part of the part-cylindrical section. Said socket is designed for mounting in the pelvis with the first circumferential part at the posterior to limit backward movement of the femoral prosthetic component, while the shorter, second circumferential part at the anterior allows a good range of forward flexion of the femoral prosthetic component.

3,722,003

MOLDED L-SHAPED LENTICULAR PROSTHESIS

David L. Walchle, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed May 18, 1971, Ser. No. 144,538
Int. Cl. A61f 1/24, 1/18
U.S. Cl. 3—1 4 Claims

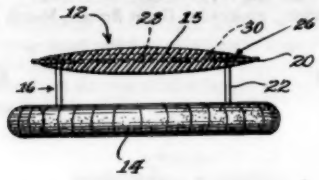
An L-shaped lenticular prosthesis molded from FEP or medical grade silicone rubber to its final size, ready for inspection, packaging and sterilization, said prosthesis being entirely free of residual stresses.

3,722,004

DISC FOR HEART VALVES

Harry W. Cromie, Pittsburgh, Pa., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Dec. 8, 1971, Ser. No. 205,852
Int. Cl. A61f 1/22
U.S. Cl. 3—1 10 Claims



A heart valve occluder includes a ring of hard, wear-resistant material such as isotropic, pyrolytic carbon embedded in a plastic matrix with the outer circumference of the ring protruding from the plastic about the entire circumference of the occluder. By this arrangement, the wear rate on the edge of the occluder is improved, while the noise of the occluder striking the struts of its cage is reduced.

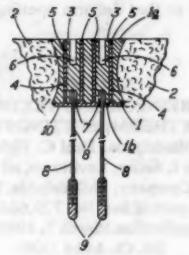
3,722,005

PERCUTANEOUS MYO-ELECTRODE SYSTEM

Frederick Claud Cowland, Towcester, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed Nov. 15, 1971, Ser. No. 198,596
Claims priority, application Great Britain, Nov. 19, 1970, 54972/70
Int. Cl. A61f 1/00; A61b 5/04; A61n 1/36
U.S. Cl. 3—1.1 9 Claims

A percutaneous myo-electrode system for facilitating either the stimulation of, or the extraction of electrical energy due to, muscular activity within the body of a vertebrate. A percutaneous member of a biocompatible carbon material is insertable into an aperture in the body tissue such that a surface thereof is substantially flush with the outer skin of the body tissue. At least one connecting member of electrically conductive biocompatible material is secured within and electrically insulated from the percutaneous member. One end of the, or each, connecting member is connectable, at the surface of the body tissue, to an electrical energy source or user external of the body, whilst the other end thereof is connected to an electrode of an electrically conductive biocompatible material by



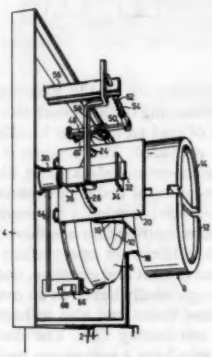
means of a connecting lead of an electrically conductive biocompatible material. The electrode is connectable to a muscle within the body. The electrical energy user can be an artificial limb, and the external electrical energy source can be used to stimulate the heart of the vertebrate.

3,722,006

DEVICE FOR ELECTRIC INCINERATOR DRY CLOSETS

Sven Olof Edholm, Villavagen 27, Vadstena, Sweden

Filed Feb. 6, 1970, Ser. No. 9,366
Int. Cl. A47k 11/02
U.S. Cl. 4—131 7 Claims

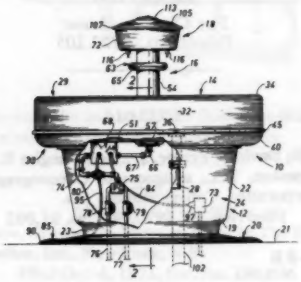


Device for electric incinerator dry closets having a collecting vessel placed in a pan featuring a downward, essentially conical taper and, at its lower end, an operable trap door. Said door also serves as a lid above an electric incinerator chamber and is divided into heat insulating, semi-circular halves which simultaneously swing upwards and outwards away from each other. The door halves are suspended from supporting members which are rigidly attached to a casing or stand. When the trap door is closed, a full length projection on the straight side of one of the door halves engages a corresponding recess in the corresponding side of the other door half. The door is kept from opening accidentally by mechanical means which are actuated when a certain weight is on the dry closet seat. The incinerator chamber burns the waste material deposited in it when the collecting vessel falls via the opening cover into said chamber.

3,722,007
GROUP WASH STATION

Bryon Camp, 20 Lawrie Road, Concord; Percival Arthur Camp, 15 Tangreen Court, and William Hasso Meyer, 8 Cresthaven Drive, both of Willowdale, Ontario, all of Canada

Filed Feb. 24, 1971, Ser. No. 118,217
Int. Cl. A47k 1/04
U.S. Cl. 4—166 11 Claims

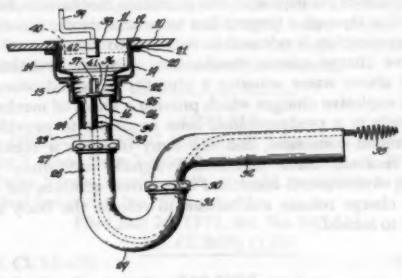


A group wash station includes an inverted frusto-conical base pedestal with a two-part molded plastic wash bowl mounted thereon. A pneumatic tread is adhesively bonded on the floor surface around the base pedestal and is operatively connected through an air hose to a pressure-actuated switch mounted in the base pedestal. The switch is in turn associated with a solenoid valve for controlling the flow of water from supply conduits to a spray head assembly mounted above the wash bowl. A rigid load-supporting plate is usefully provided under the wash bowl for transmitting stresses to the base pedestal.

3,722,008
DRAIN CLEANERS

John Boldan, 294 Butler Rd., N.E., Warren, Ohio

Filed March 15, 1971, Ser. No. 124,305
Int. Cl. E03c 1/302
U.S. Cl. 4—255 7 Claims

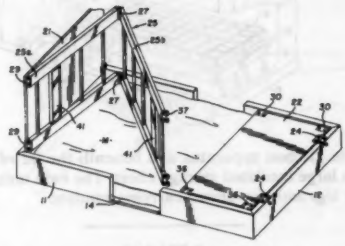


A device for maintaining the drain of a receptacle, such as the usual household sink, in good water-draining condition, comprising a snake passing through an opening in the bottom wall of a strainer drain basket, the snake remaining in the drain trap for instant use, but being withdrawable partly or fully without great effort.

3,722,009
PORTABLE CRIB

Helen R. Hrynda, 3386 Kingston Lane, Youngstown, Ohio

Filed Aug. 3, 1971, Ser. No. 168,599
Int. Cl. A47d 9/00
U.S. Cl. 5—93 10 Claims

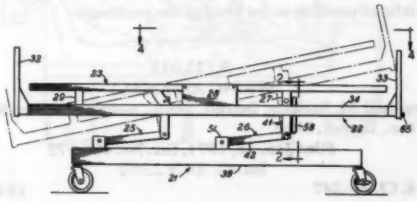


A crib is foldably contained in a portable receptacle. The base members of the crib are formed by the receptacle itself when in an open position and end panels of the crib are hingedly attached to each base member. Side rails of the crib are hinged to each end panel and can be swung into position after the panels are raised to a vertical position. Means are provided to lock the side rails to the base members and to the end panels. Legs for the crib are foldable within each side rail and can be locked in operational position to form a sturdy crib raised off of the floor.

3,722,010
ADJUSTABLE HOSPITAL BED INSTANTLY MOVABLE TO A TRENDELENBURG POSITION

Joseph P. Saternus, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed March 31, 1971, Ser. No. 129,719
Int. Cl. A61g 7/00
U.S. Cl. 5—67 3 Claims



The hospital bed has articulated head and foot elevation linkage systems that effect vertical movement of an upper horizontal frame, to which a mattress supporting structure is attached, with respect to a fixed lower horizontal frame. Rapid shifting to a trendelenburg position is achieved by providing, in the foot linkage system, an extendible segment having a pair of elongated links one of which is slidably and rectilinearly movable in the other. The segment may be quickly extended and locked, and by so doing the upper frame becomes tilted at a desired trendelenburg angle with its foot end raised relative to its head end.

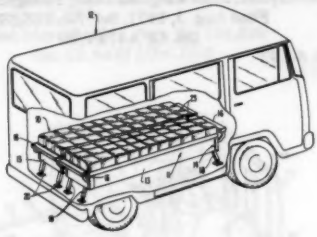
3,722,011
CAMPING FURNITURE

Larry Miller, Route 1, Box 371-J, Selah, Wash.

Filed May 6, 1971, Ser. No. 140,745
Int. Cl. A47c 17/64
U.S. Cl. 5—118 5 Claims

A pair of bench units may be utilized by campers in vans or under canopies or tents. Each unit embodies a padded lid serv-

ing as a single bed. The two bench units side-by-side in a van or tent form a double bed. Beneath the lid of one unit is a



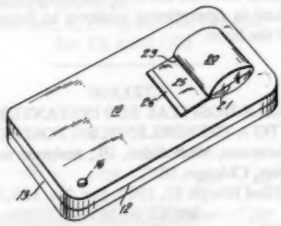
complete kitchen apparatus and beneath the lid of the other unit is a large insulated storage chest. The twin units have adjustable legs and convenient carrying handles.

3,722,012

WATER BED HAVING AN ATTACHED PILLOW

Sidney Tobinick, Oldbridge, and Arnold Semenoff, Fort Lee, both of N.J., assignors to Aqua Therm Products Corporation, Rahway, N.J.

Filed June 3, 1971, Ser. No. 149,512
Int. Cl. A47c *27/08*
U.S. Cl. 5—348 WB **9 Claims**



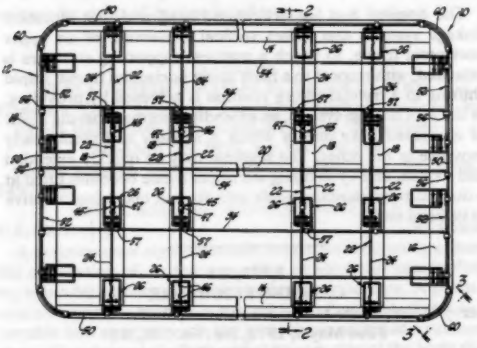
A plastic enclosure to be filled with a fluid to define a body upon which one may recline has an inflatable pillow fixed to a region of the enclosure by an elongated web and is movable to a defined position at the head of the enclosure.

3,722,013

SPRING ASSEMBLY

Zygmunt M. Surletta, Detroit, Mich., assignor to Lear Siegler, Inc., Detroit, Mich.

Filed Jan. 18, 1971, Ser. No. 106,972
Int. Cl. A47c *23/02*
U.S. Cl. 5—247 **10 Claims**



A box spring assembly including a generally rectangular frame with a first plurality of spring members extending transversely between the sides of the frame and spaced from one another longitudinally of the frame. Each spring member is defined by an integral wire having a straight load section and a fishmouth section at each end thereof. The spring members are disposed in pairs overlapping one another transversely of the assembly. The particular improvement is the disposition of pairs of undulations in the straight sections of each spring member so that the spring members may be positioned or aligned longitudinally of one another by disposing a clip about the straight sections between adjacent pairs of undulations.

ERRATUM

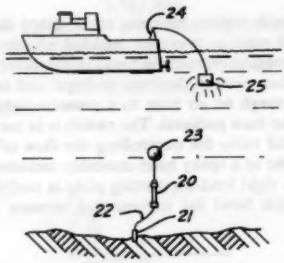
For Class 5—8 see:
Patent No. 3,722,205

3,722,014

RETRIEVABLE BUOY

Jack O. Hill; David S. Fridge, Jr., and Vaughn R. Dibble, Jr., all of Houston, Tex., assignors to Oceanography International Corporation, College Station, Tex.

Filed Nov. 19, 1970, Ser. No. 91,002
Int. Cl. B63b *21/52*
U.S. Cl. 9—8 R **12 Claims**



A retrievable, submersible buoy is disclosed which is anchored at an underwater location and includes an explosive charge release mechanism which releases the buoy from its anchor in response to a remotely actuated recall signal. The buoy may be anchored by an inflatable bag that becomes buried in the sea bed and is filled so as to be buoyant in response to actuation of the explosive charge release mechanism, or by connection through a lanyard line to an underwater structure which connection is released in response to actuation of the explosive charge release mechanism. A recall transmitter located above water actuates a plurality of sound sources, such as explosive charges which provide a series of mechanical signals in a predetermined time sequence to provide a coded recall command, and the buoy includes a receiver which receives these mechanical signals and when the properly coded recall command is received actuates the explosive charge release mechanism to release the buoy and cause it to ascend.

3,722,015

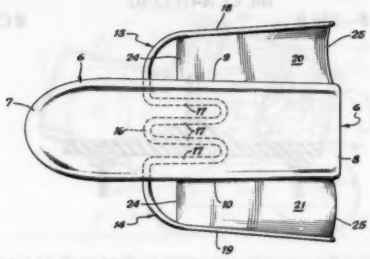
WATER BOARD

William S. Miller, and Oscar E. Miller, both of P.O. Box 947, Placerville, Calif.

Filed Dec. 10, 1970, Ser. No. 96,936
Int. Cl. A63c *15/04*
U.S. Cl. 9—310 B **8 Claims**

A water board for personal use includes a buoyant float designed to carry a person on the water. Longitudinal frames extend along both sides of the float, each supporting one or

more submerged vanes. Each vane is transversely taut along the leading edge thereof and transversely slack along the trailing edge thereof. The user rocks the float from side to side and so flexes the vanes to propel the float forwardly.

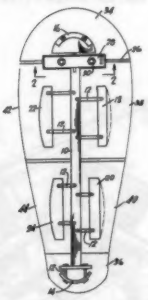


3,722,016

SHOE STRETCHER

Rene B. Tavo, Deming, N. Mex., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Oct. 4, 1971, Ser. No. 186,036
Int. Cl. A43d *5/00*
U.S. Cl. 12—120.5 **4 Claims**



Apparatus for stretching shoes comprising, in horizontal alignment, a horizontal toe plate, a horizontal heel plate, left horizontal plate means extending on the left side between toe and heel plates, right horizontal plate means extending on the right side, and means to individually move anyone of the means or plates forward rearward or sideways as the case may be relative to all other elements of the structure.

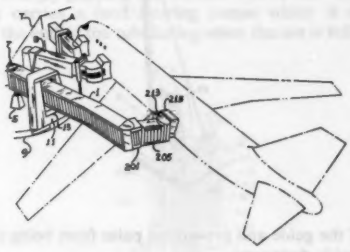
3,722,017

OVER-THE-WING AIRCRAFT LOADING BRIDGE

Peter T. Gacs, Palos Verdes Peninsula, and Lucien C. Williams, Palos Verdes Estates, both of Calif., assignors to General Steel Industries, Inc., St. Louis, Mo.

Filed July 26, 1971, Ser. No. 165,511
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **7 Claims**

A bridge for transferring passengers between airport terminal buildings and access doors of aircraft located rearwardly of the aircraft wing has a main passageway member pivotally supported at the terminal building end on vertical and transverse axes and intermediate its ends on a track mounted rack propelled carriage on which it is elevatable and depressable by a combined hydraulic and screw jack system so that its outer end portion, slightly arched, may extend over the wing. At its outer end the main passageway mounts a lateral passageway for pivotal movement about a vertical axis and vertical movement about a horizontal axis of the lateral passageway. The lateral passageway mounts an outer end unit containing an operator's cab, for pivotal movement about a vertical axis to positions parallel to aircraft fuselages. The outer end unit contains an extendible canopy for sealing engagement with the fuselage side.

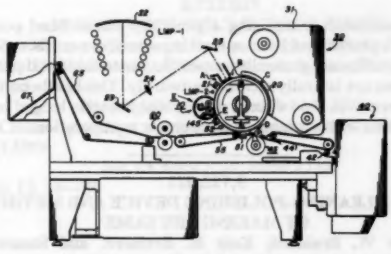


3,722,018

CLEANING APPARATUS

Donald J. Fisher, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation of Ser. No. 873,870, Nov. 4, 1969, abandoned.
This application Nov. 8, 1971, Ser. No. 196,538
Int. Cl. G03g *15/00*
U.S. Cl. 15—1.5 **8 Claims**



Apparatus is herein disclosed for cleaning residual toner particles from a photosensitive member. A fibrous brush is arranged to move in an endless path to first wipe the brush fibers across the member and then over a biased transfer roll. Prior to contacting the transfer roll, the brush fibers and toner collected thereon are subjected to a corona discharge capable of charging the toner and fibers to a polarity opposite to that of the transfer roll wherein sufficient electrostatic contrast is produced to effect an efficient transfer of toner from the brush to the roll surface.

3,722,019

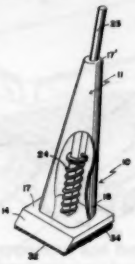
PAINT TRIMMING DEVICE

Walter Magnien, 5414-53rd Street, Camrose 1, Alberta, Canada

Filed April 27, 1971, Ser. No. 137,769
Int. Cl. A46b *17/00*
U.S. Cl. 15—114 **4 Claims**

A spring loaded detachable pad component is carried in a small hand held housing and can be extended for charging

with paint. The housing has an angulated guide and a stop against which the bristles of said pad engage thus holding them



clear of the guide and preventing paint from being picked up by the guide during use.

3,722,020

TOOTHBRUSH WITH CONCAVITY FORMED BY BRISTLE ENDS

Jeffrey Mark Hills, 7820 Algon Avenue, Philadelphia, Pa.

Filed Jan. 4, 1971, Ser. No. 103,591

Int. Cl. A46b 9/04

U.S. Cl. 15—167 R **10 Claims**

A toothbrush comprising a generally planar head portion having a plurality of bristles forming a concave surface. Some of the bristles are generally perpendicular to said head portion and some are laterally inclined outwardly. This bristle configuration removes food debris, plaque and bacteria ledged in the sulcus area with a minimum of operator manipulation.

3,722,021

SHOE CLEANING-POLISHING DEVICE AND METHODS OF MAKING THE SAME

Andrew W. Brainerd; Kent H. Brainerd, and Stuart W. Brainerd, all of One North LaSalle Street, Winnetka, Ill.

Continuation-in-part of Ser. No. 39,275, May 21, 1970, abandoned. This application March 29, 1971, Ser. No. 129,006

Int. Cl. A47l 13/46, 13/12; A46b 11/02

U.S. Cl. 15—231 **7 Claims**

A device integrating into a single hand-operated unit of convenient size, the expendable material and accessory equipment needed to provide, apply, distribute, brush and buff a wax or similar polish on the shoe, during which entire process the hand holding the shoe is not caused to relinquish its grip thereon. Additionally, new and useful means of insertion, retention and removal of an aerosol can into and from proposed housings serving as integrated shoe cleaning-polishing devices, and identification window apertures in the backing shell of such housings, are described.

3,722,022

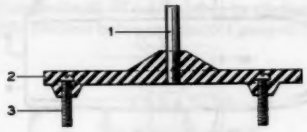
ROTATING PAINT SCRAPER

John A. Falleson, 288 Walzford Rd., Rochester, N.Y.

Filed Sept. 15, 1971, Ser. No. 133,186

Int. Cl. A47l 13/02

U.S. Cl. 15—236 R **8 Claims**



Apparatus for removing an outer surface such as a coating of paint from a masonry base includes a rotatable, resilient disc having a support stem extending from one side of the disc, and a set of elongated members extending from the other side. To use the apparatus, the stem is secured in the chuck of a portable power drill, and the disc is rotated and positioned so that the free ends of the elongated members scrape the outer surface from the base.

3,722,023

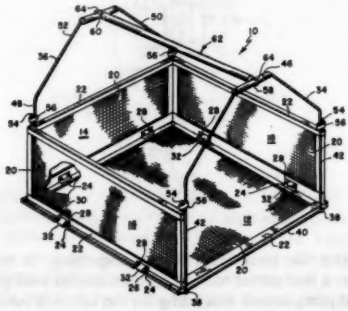
LEAF AND REFUSE CATCHER

Jack K. Gray, Rt. 1, Box 138, Niceville, Fla.

Filed March 12, 1971, Ser. No. 123,602

Int. Cl. A01d 11/00

U.S. Cl. 15—257.1 **4 Claims**



A collapsible basket-like catcher or carrier having bottom and side panels of mesh wire screen, the side panels being pivotally connected to the bottom panel, a pair of handles on said bottom panel, and locking means on said handles and side panels, whereby the side panels may be locked to each other in an upstanding position for collecting and carrying leaves and refuse or may be collapsed upon said bottom panel for storage.

3,722,024

FOOT PEDAL OPERATED ADJUSTABLE RUG NOZZLE FOR VACUUM CLEANER

Joseph F. Schmitz, Saint Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

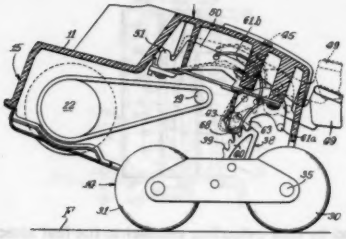
Filed Nov. 10, 1971, Ser. No. 197,291

Int. Cl. A47l 5/34

U.S. Cl. 15—339 **16 Claims**

A mounting structure for adjustably mounting a vacuum cleaner nozzle for selective disposition in different rug cleaning dispositions. The nozzle position is adjusted by pressing down with the user's foot on a pedal to incrementally raise the

front end of the nozzle to different desired elevations for use in cleaning any one of a plurality of rugs having different height pile. The mounting structure is further arranged to permit the movement of the nozzle to lower positions by an urging thereof such as by the user's foot on the upper surface of the nozzle. An indicator is provided for indicating the elevational setting of the nozzle.



3,722,025

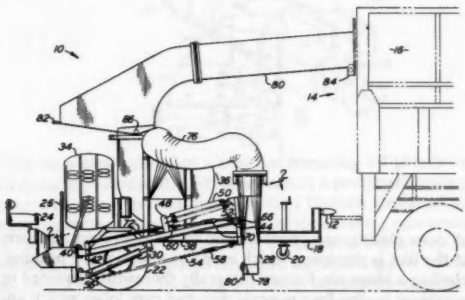
LEAF COLLECTOR

William Gledhill, Galion, Ohio, assignor to Gledhill Road Machinery Company, Galion, Ohio

Filed July 12, 1971, Ser. No. 161,551

Int. Cl. A47l *5/00*

U.S. Cl. 15—340 **10 Claims**



Leaf collecting apparatus including a nozzle positioned close to the ground to serve as an inlet for leaves which are conducted through appropriate ducting to a refuse container. A conventional blower is used to apply a vacuum for sucking the leaves into the nozzle. Hydraulically actuated piston and cylinder combinations are used for adjusting the location of the nozzle both vertically and horizontally to position it for effective operation. Means are also provided for allowing the nozzle to pivot about both a horizontal and vertical axis when said nozzle encounters an obstruction. Biasing means are provided for automatically returning the nozzle to its adjusted position after the nozzle moves away from the obstruction.

3,722,026

CASTER GLIDE

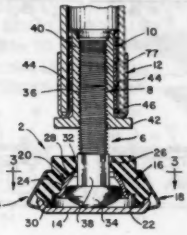
Julius B. Wilhelmi, Hull, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed June 17, 1971, Ser. No. 154,091

Int. Cl. A47b *91/06*

U.S. Cl. 16—42 **6 Claims**

A caster glide for supporting the hollow tubular leg of a furniture piece. A hollow glide shoe which rests on a floor or floor covering includes a semispherical swivel plate nonrotatably seated in the shoe. Also seated within the shoe and bearing against the undersurface of the swivel plate in the manner of a ball-and-socket joint is the semispherical head of a bolt, the shank of which projects through an opening in the swivel plate and beyond the upper surface of the shoe. The bolt shank is threaded into a nut which seats in the tubular furniture leg and is retained therein by a fastener secured to the nut and bitingly gripping the internal wall of the tubular leg. The nut carries a load bearing means which is disposed beneath the end of the tubular leg when the nut is fully seated



therein and is adapted to transmit a load on the furniture piece to the nut, the bolt and the shoe. The shoe is axially adjustable relative to the furniture leg by turning the bolt into or retracting same from the nut and the shoe is pivotal about the ball-and-socket joint of the swivel plate and bolt head for adjusting its angular orientation relative to the bolt to provide flush seating on the floor or floor covering. The bolt and swivel plate embody cooperating wrenching means which positively engage to insure effective turning of the bolt responsive to rotation of the shoe.

3,722,027

HINGES WITH BUILT-IN DOOR CHECK

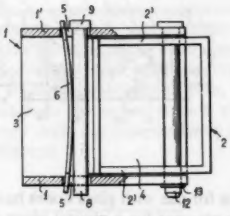
Pierre Ventre, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed April 9, 1971, Ser. No. 132,770

Claims priority, application France, April 10, 1970, 7013006

Int. Cl. E05f *3/20;* **E05d** *11/08*

U.S. Cl. 16—50 **4 Claims**



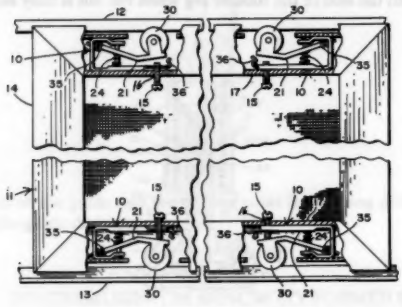
This hinge device with friction-type built-in door retainer is designed more particularly for the side doors of automotive vehicles and comprises two straps, one strap having its parallel wings pivoted to a pivot pin extending between the parallel wings of the other strap, the wings of the first strap being interconnected, beyond said pin, by a first door holding member lying on the path of a second door holding member secured between the wings of the other strap. One of these two holding members is adapted to recede against the resilient force of a spring when engaged by the other member.

3,722,028

SLIDING PANEL ROLLER ASSEMBLY

Michael P. Schoenbrod, Miami, Fla., assignor to Aircheck, Inc., Miami, Fla.

Filed Feb. 22, 1972, Ser. No. 227,719
Int. Cl. E05d 13/02
U.S. Cl. 16—91 2 Claims



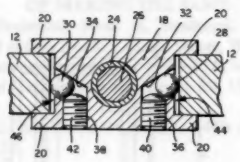
A roller assembly for sliding panels having a U-shaped frame with one leg portion being longer and in spaced relation to the other, and a roller carrying arm portion pivoted adjacent to the shorter leg portion and releasably held at its other end by a latch at the free end of the longer leg portion. A first coil spring yieldingly urging the arm to remain on the latch and a second coil spring yieldingly urges the arm to swing in a direction away from the longer leg portion and a bolt threaded in a bore on the longer leg portion engages the arm whereby upon threading the bolt, the arm is released from the latch.

3,722,029

COMBINED HINGE AND GLASS DOOR UNIT

William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 820,541, April 30, 1969, Pat. No. 3,555,733. This application Jan. 18, 1971, Ser. No. 107,232
Int. Cl. E05d 7/04
U.S. Cl. 16—129 18 Claims



A hinge means for use with glass doors having solid frames includes a hinge element for a pivotal hinge of the type used where the door is pivoted at top and bottom, which element is laterally adjustable to provide means for correcting misalignment after the door has been hung.

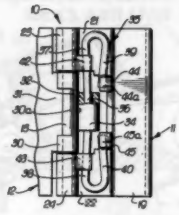
3,722,030

SELF-LATCHING HINGE

Tom E. Smith, Los Angeles, Calif., assignor to Jaybee Manufacturing Corp., Los Angeles, Calif.

Filed Sept. 15, 1971, Ser. No. 180,746
Int. Cl. E05d 11/08
U.S. Cl. 16—142 9 Claims

A self-latching hinge includes a roller-biasing wire spring retained against the knuckles of one hinge leaf by ears formed from incompletely curled portions of the bearing sleeves of that leaf and by tabs extending parallel to the leaf attachment plate and bent forwardly into a plane parallel with the ears.

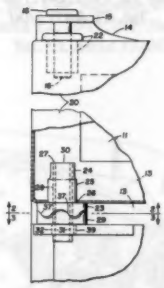


3,722,031

DOOR CLOSING AND CHECK DEVICE FOR REFRIGERATORS, FREEZERS AND THE LIKE

Joseph F. Bourgeois, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed April 20, 1971, Ser. No. 135,628
Int. Cl. E05f 1/06
U.S. Cl. 16—153 2 Claims



A door closing and check device for refrigerators, freezers and the like is disclosed which employs a stationary bushing, including a hinge pin formed integrally therewith, mounted to the cabinet having four upperly directed cam lobes which engage four complementary, downwardly directed cam lobes of a rotable bushing mounted to the door and rotating in its hinge axis. The lobes of the two bushings are located relative to each other to cause the weight of the door to swing the same to its closed position from a partially open position as well as to check and maintain the door in two successively wider open positions of approximately 85° and a 175°. The two bushings are also formed in a manner to prevent their improper installation and consequent misfunction in the door and cabinet.

3,722,032

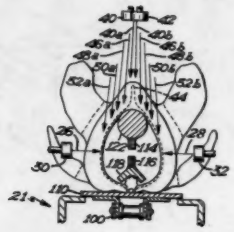
APPARATUS FOR CUTTING AND REMOVING MEAT FROM BONES

James E. Draper, and Jack J. Rejsa, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 716,137, March 26, 1968, Pat. No. 3,570,050. This application Nov. 17, 1970, Ser. No. 90,302
Int. Cl. A22c 17/04
U.S. Cl. 17—1 G 6 Claims

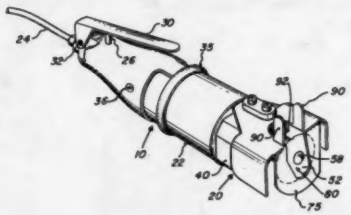
An apparatus for removing meat from bones of animals, e.g., chickens, consisting of a nozzle for forming a jet of a liquid (water or other liquid) having the form of a relatively thin sheet composed of several aligned parallel streams. The jet is directed at the animal preferably at a relatively small

angle of incidence to the surface of the bone. The animal is placed upon a conveyor and advanced relative to the jet to



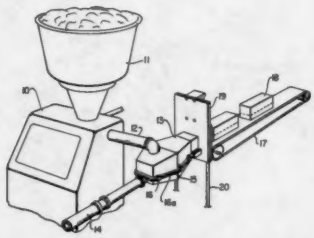
form an elongated knife-like cut through the meat. In a typical application breast fillets are removed from the sternum (keel) and rib cage.

3,722,033
FOWL DRESSING TOOL
Neil O. Swan, Route 1, St. Cloud, Minn.
Filed Sept. 27, 1971, Ser. No. 184,086
Int. Cl. A22b *3/08*
U.S. Cl. 17—11 **9 Claims**



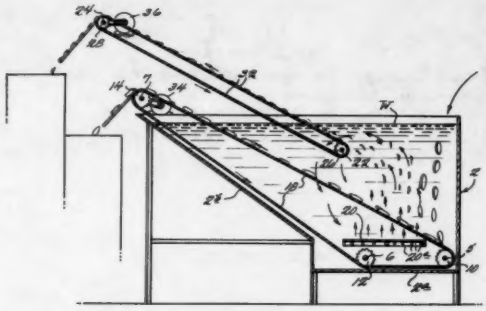
This invention relates to a tool for removing oil glands or sacs from fowl carcasses and incorporates a pneumatic rotary motor with a cutter and guard section thereon designed to locate the cutter blade in an area where the severing operation can be effected with a minimum of carcass loss and in a minimum of time. The guard structure includes a guard to expose only a portion of the blade for safety purposes and guides at the area exposed to insure accurate location of the blade in the severing operation.

3,722,034
CUT-OFF DEVICE FOR FORMING APPARATUS
Valerio A. Baccetti, San Leandro, Calif., assignor to Armour and Company, Chicago, Ill.
Filed Nov. 9, 1970, Ser. No. 87,937
Int. Cl. A22c *7/00*
U.S. Cl. 17—32 **14 Claims**



In the forming or extrusion of comminuted material products, such as meat loaf products, through a forming or extruder horn onto a receiving surface, such as a conveyor, a knife is supported for movement adjacent the horn outlet and between the horn and receiving surface for severing the formed or extruded material. If the forming or extruding apparatus is operated intermittently, the knife is automatically actuated in response to the stopping of the former or extruder.

3,722,035
METHOD FOR REMOVING MEAT FROM THE SHELLS OF BIVALE MOLLUSKS
Fletcher Hanks, P.O. Box 70, Easton, Md.
Filed Jan. 27, 1971, Ser. No. 110,047
Int. Cl. A22c *29/00*
U.S. Cl. 17—48 **2 Claims**

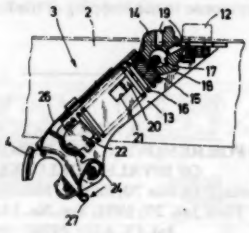


Bivalve mollusks, such as clams, are, with with meat intact, heated sufficiently to obtain the partial opening of the shells and the withdrawal of at least one end of the adductor muscle from the shell; and while the bivalve mollusk is in this condition it is permitted to fall downwardly into and through a body of water which is devoid of a quantity of salt which would have any deleterious effect upon the meat of the bivalve, or which would make the expended water objectionable for municipal sewage operations; then there is introduced into the lower portion of the body of water compressed air of sufficient magnitude and so located as to provide upwardly rising air bubbles which are capable of assisting in the separation of the meat from the shell and the flotation of the meat upwardly into the upper portion of the body of water while permitting the empty shells to continue to fall downwardly therein; the separated meats are removed from the upper portion of the body of water; and the empty shells are independently removed from the lower portion thereof.

3,722,036
APPARATUS FOR MOUNTING TOP ROLLERS
Franz Fuchs, Magstadt, Germany, assignor to Kugellagerfabriken Gesellschaft mit beschraenkter Haftung, Schweinfurt, Germany
Filed March 3, 1971, Ser. No. 120,535
Claims priority, application Germany, March 4, 1970, P 20 10 104.6
Int. Cl. D01h *5/50*
U.S. Cl. 19—282 **12 Claims**

A top roller for a drawing mechanism is mounted on a link

at the end of a housing. A spring is mounted within the housing to press against the link. Cam means is provided to vary

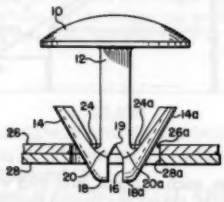


the spring rate of the spring to adjust the pressure on the roller.

3,722,037
LOCATING PLUG

Joseph H. Jaeger, Indianpolis, Ind., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 23, 1971, Ser. No. 178,518
Int. Cl. A44b *21/00*; F16b *13/04*
U.S. Cl. 24—73 PF **2 Claims**



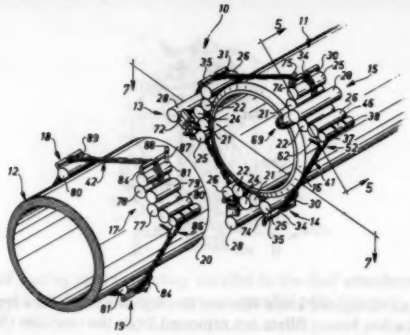
A locator plug in initial form of a one-piece plastic fastener of the type having an enlarged head at one end of a shank with wings or arms diverging from the opposite end of the shank toward the head and adapted to be passed through apertures in two or more workpieces such as sheet material panels or other structural members which are trapped between the head and the wings; and with the wings joined to the adjacent end of the shank by hinge connections affording maximum pivotal movement of the wings from positions substantially parallel to the shank to positions substantially normal thereto.

3,722,038
PIPE CLAMPING DEVICE

Frederich Otto Wilhelm Arntz, 184 Oakridge Dr., York, Pa., and Geurney Elden Walton, 322 Reinecke Dr., York, Pa.

Filed Feb. 9, 1972, Ser. No. 226,563
Int. Cl. A44b *21/00*; B25b *1/20*; F16l *13/02*
U.S. Cl. 24—81 PE **35 Claims**

A pipe-clamping device for positioning two pipe sections in correct axial alignment and with a desired axial end separation therebetween comprises two sets of pipe-clamping shoes which are moved into positive clamping engagement with first and second pipe sections respectively by chains engaging those shoes and extending around respective ones of the pipe sections, the shoes being provided with slotted plates for receiving selected links of the chains and terminal turnbuckle adjusting mechanisms on the chains being used to tighten them and to provide the positive clamping engagement. Radially disposed and adjustable pipe-positioning or centering pins are provided on extensions of the first set of shoes for obtaining correct axial alignment of the second pipe section with the first pipe section. Removable turnbuckle mechanisms extend

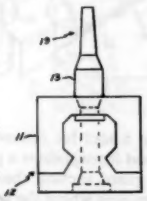


between the pipe-clamping shoes of one set and those of the other set to permit adjustment of the axial separation between the two pipe sections.

3,722,039
PLASTIC ZIPPER/CLOSURE FOR FLEXIBLE CONTAINERS

William Paul Robbins, 504 Manchester Rd., Middletown, Ohio, and Clifford R. Bullock, 522 Cheshire, Fort Woetan Beach, Fla.

Filed Feb. 9, 1971, Ser. No. 113,837
Int. Cl. A44b *17/00*
U.S. Cl. 24—201 C **6 Claims**

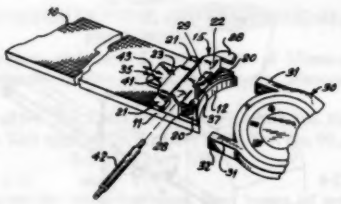


A series of flexible and elongated plug or rod-like elements installed along one side of the normally zipper-closed seam of a flexible, aircraft engine-container are mated in tight-fitting relation within a series of matching openings formed along the opposite side of the seam to thereby counteract any tendency of the seam to open under stress.

3,722,040
WATCH BRACELET END CONNECTION STRUCTURE

Stanley Meyerson, 111 Ocean Avenue, Brooklyn, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,605
Int. Cl. A44c *5/00*
U.S. Cl. 24—265 B **9 Claims**



A watch bracelet end connection including a hollow body having a pair of intersecting through passageways, one extending generally transversely of an associated bracelet and the

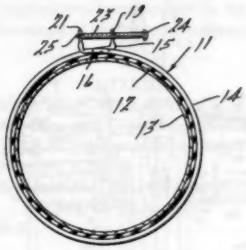
other generally longitudinally of the bracelet. And a connector pin receiver insertable into the longitudinally extending passageway for adjustable location therein to selectively locate the pin in said transversely extending passageway, the receiver having a deformable element for locking the receiver in position relative to the hollow body.

3,722,041

RING CLAMP

Robert A. Munse, Troy, Mich., assignor to Microdot Inc., Troy, Mich

Filed July 13, 1971, Ser. No. 162,174
Int. Cl. B65d *63/02*
U.S. Cl. 24—283 1 Claim



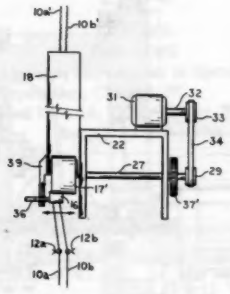
A ring is constructed from a length of wire formed into a circle with the ends bent at right angle and tilted at an angle away from each other. The ends are flattened normal to the plane of the ring to form parallel flanges through which apertures are provided. The aperture in one of the flanges is threaded for supporting a screw of substantial length having a head at one end and a reduced cylindrical nib at the other end which extends into the aperture of the other flange. When the ends of the ring are offset and overlapped the nib at the end of the screw extends into the aperture in the other flange and due to the opposite angular tilt to the flanges the axis of the screw falls in a plane through the engaged sides of the ring. By advancing the screw through the threaded aperture the flanges are moved away from each other thereby tightening the ring about a tube to be sealed.

3,722,042

STRAND TREATMENT

Robert K. Stanley, Media, and Ira Schwartz, Philadelphia, both of Pa., assignors to Techniservice Corporation, Kennett Square, Pa.

Filed Jan. 31, 1972, Ser. No. 222,135
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 16 Claims



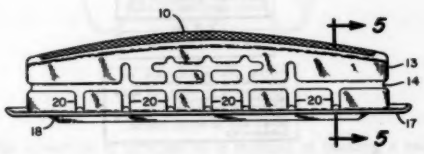
While being fed into a laterally confining region to be retained temporarily and compressively crimped therein, laterally spaced textile strands are traversed laterally to and fro along the entrance to the region. The resulting uneven cross-sectional distribution of crimped strand accumulation in the region is conducive to separation of individual strands upon exiting from the region.

3,722,043

REINFORCED SHADOW MASK FOR COLORED TV PICTURE TUBES

Myron C. Kirchner, Itasco, Ill., assignor to Tubal Industries, Inc., Elk Grove Village, Ill.

Division of Ser. No. 822,792, April 2, 1969, Pat. No. 3,639,799. This application April 19, 1971, Ser. No. 135,307
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.11 2 Claims



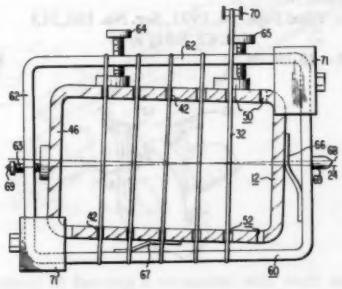
A shadow mask for color TV picture tubes contains the conventional foraminous or translucent area formed by a multitude of miniature apertures in a curved portion of a thin metal sheet through which the electron beams pass in traveling from the electron guns at the rear of the tube to the viewing face at the front of the tube. Around the translucent area is an imperforate section formed into a wall and a flange and containing strengthening ribs. A reinforcing ring rigidly attached to the flange provides additional stability. Ordinarily, the mask assembly is mounted to the glass bulb of the picture tube by metal, spring-like members which are attached to the wall of the mask.

3,722,044

FABRICATION OF FOCUS GRILL TYPE CATHODE RAY TUBES

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 10, 1971, Ser. No. 197,267
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.16 5 Claims

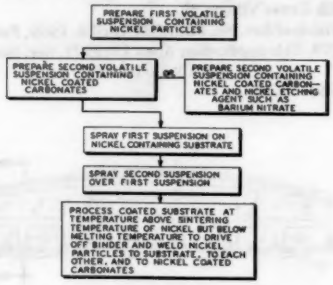


Prior to assembly of the envelope of a focus grill tube, the cup-shaped panel portion of the envelope is wound with a wire helix which is disposed around and along the panel, each turn of the helix extending across the open side of the panel in predisposed relation with a pattern of phosphor strips on the bottom wall of the panel. Preferably, the helix turns are disposed in grooves in the end surface of the side wall of the panel, and portions of each helix turn are disposed about a member having a thermal expansion greater than that of the helix wire.

3,722,045
METHODS OF IMPROVING ADHERENCE OF EMISSIVE MATERIAL IN THERMIONIC CATHODES

William E. Buescher, Emporium, Pa., assignor to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed June 30, 1971, Ser. No. 158,576
Int. Cl. H01j 9/00
U.S. Cl. 29—25.17 6 Claims

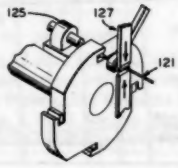

PREPARE FIRST VOLATILE SUSPENSION CONTAINING NICKEL PARTICLES
PREPARE SECOND VOLATILE SUSPENSION CONTAINING NICKEL COATED CARBONATES
OR
PREPARE SECOND VOLATILE SUSPENSION CONTAINING NICKEL COATED CARBONATES AND NICKEL ETCHING AGENT SUCH AS BARIUM NITRATE
SPRAY FIRST SUSPENSION ON NICKEL CONTAINING SUBSTRATE
SPRAY SECOND SUSPENSION OVER FIRST SUSPENSION
PROCESS COATED SUBSTRATE AT TEMPERATURE ABOVE SINTERING TEMPERATURE OF NICKEL BUT BELOW MELTING TEMPERATURE TO DRIVE OFF BINDER AND WELD NICKEL PARTICLES TO SUBSTRATE, TO EACH OTHER, AND TO NICKEL COATED CARBONATES

An application of metal particles comprised substantially of nickel to a nickel containing cathode substrate is followed by the application of potentially emissive materials comprised of nickel coated carbonates of barium and/or strontium and/or calcium. The particles and nickel coated carbonates are diffusion bonded or welded to the substrate and to each other after the cathode is mounted in a tube, simultaneously with activation of the cathode. The coating thus provided is very adherent and reduces arcing during high voltage applications. An alternate embodiment for further increasing adherence of the emissive material comprises adding a nickel etching agent, such as barium nitrate, to the potentially emissive material suspension. During the temperature increase noted above to activate the cathode, the etching material first melts and densifies the carbonates and then decomposes to etch the nickel particles and the substrate. Further heating changes the etching material and stops the reaction.

3,722,046
APPARATUS AND METHOD FOR PRODUCING FOUR PIECE LEAD WIRE ASSEMBLIES

Robert H. Alexander, Russell, and Paul E. Ballard, North Warren, both of Pa., assignors to GTE Sylvania Incorporated, Seneca Falls, N.Y.

Filed Sept. 14, 1971, Ser. No. 180,313
Int. Cl. H01j 9/46
U.S. Cl. 29—25.19 8 Claims

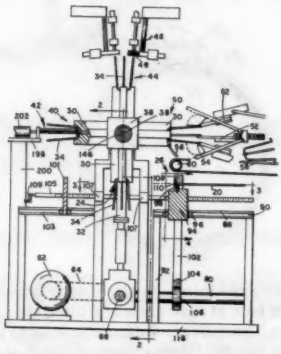


Apparatus and method for simultaneously producing four piece lead wire assemblies during which a plurality of wires are fed at varying intervals to a rotating turret as it revolves through a series of three work stations and one idle station. At the first work station, a first lead wire is fed into the turret where it is clamped by a clamping means located within the turret. A cutter then cuts the first wire after which this newly formed first piece is rotated to the second work station wherein a second wire is fed, cut, and bonded to one end. This joined assembly is then rotated to the idle station where, after a predetermined time interval, it is rotated to the third work station. Here, a third wire is fed, cut and joined to the unbonded end of the second lead. During this same time period, a fourth wire is fed, cut, and joined to the unbonded end of the first lead. The entire four piece lead wire assembly is then ejected from the turret into a receiving magazine.

3,722,047
HIGH CHAIR FORMING APPARATUS

Raymond H. Hulst, Rte. 1, Hamilton, Mich.

Filed Oct. 18, 1971, Ser. No. 190,088
Int. Cl. B21f 15/08, 45/00
U.S. Cl. 29—34 D 21 Claims

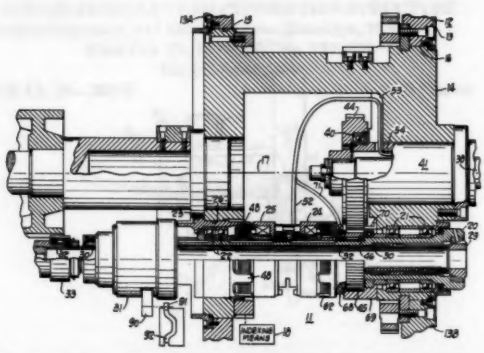


An apparatus for forming support members for reinforcing rods. A pair of crossed wires are cut and bent into a U-shape and thereafter retained in a concave cavity of the forming die which is rotated about a rotary turret to a weld station at which the crossed wires are welded together. The welded U-shaped wires are then transferred in the die to a capping mechanism or to an end bending mechanism. The capping mechanism applies caps to the ends of the wires. The end bending mechanism bends the ends of the wires upwardly. The capping mechanisms and the end bending mechanism are adjustable to accommodate wires of different lengths for making support members of different heights.

3,722,048
SPINDLE CONTROL

Karl P. Schubert, Mayfield Heights, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Sept. 15, 1971, Ser. No. 180,699
Int. Cl. B23b 9/04, 31/26
U.S. Cl. 29—37 R 20 Claims



A spindle control for a multiple spindle automatic bar machine tool is disclosed with the machine tool being one hav-

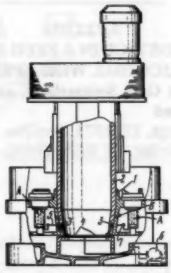
ing a spindle carrier journaled in a frame for indexable rotation about an axis. A plurality of bar receiving rotatable spindles are journaled in the spindle carrier and an electric clutch and brake unit is provided within the length of the spindle carrier for each spindle with the clutch and brake unit having a small enough outside diameter to pass through one of the end openings of the spindle carrier during manufacture and having a sufficiently large inside diameter to accept bar workpieces through the hollow spindle. Collets are provided in each spindle to grip the bar workpieces and are actuated by means which has no relative rotation between the collet actuator and the finger holder sleeve on each spindle, yet permits relative indexing movement between each sleeve and the collet actuator. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,722,049

VERTICAL MULTIPLE SPINDLE MACHINE

Artur Markovich Itin, and Ernst Khaimovich Agishtein, both of Moscow, U.S.S.R., assignors to Moskovsky Stankostroitelny Zavood, Moscow, U.S.S.R.

Filed July 28, 1971, Ser. No. 166,889
Int. Cl. B23p *23/02*
U.S. Cl. 29—38 A **2 Claims**



In a vertical multiple spindle machine, the outlets of the oil supply passages provided in the stationary column mounting a table capable of revolving about this column and carrying hydraulic clamping means and the oil inlets of the table are disposed at the same level and arranged so that in each fixed position of the table a regular inlet thereof communicates with the same outlet of the passage of the column, while in the process of turning the table from one fixed position to another the inlets of the table alternately and successively communicate with the remaining outlets of the passages of the column.

3,722,050

ROLLERS

Abe Samuels, Chicago, Ill., assignor to Speed-O-Print Business Machines Corporation, Chicago, Ill.

Filed Nov. 16, 1970, Ser. No. 89,642
Int. Cl. B21b *31/08*
U.S. Cl. 29—129.5 **3 Claims**

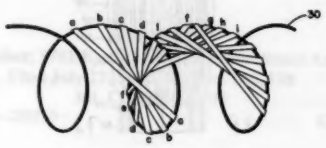
A roller having a resilient body member mounted on a shaft, with the body member embodying integral hub portions of reduced cross section extending from the opposite ends thereof.

3,722,051

METHOD OF MAKING A RADIAL BEARING CONTAINING END-LOADED FILAMENTS

Bernard G. Stiff, Lynnfield, and Thomas M. Finelli, North Andover, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio

Division of Ser. No. 65,646, Aug. 20, 1970, Pat. No. 3,675,980.
This application Feb. 14, 1972, Ser. No. 226,344
Int. Cl. B21d *53/10;* **B23p** *17/00*
U.S. Cl. 29—149.5 NM **1 Claim**



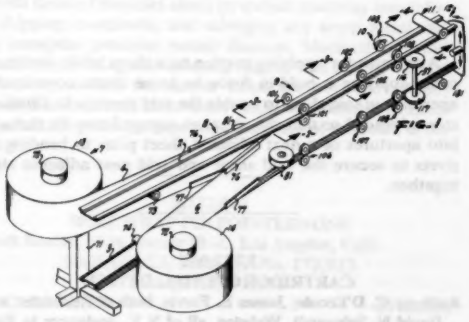
The invention is directed to a method of making a radial bearing wherein filaments are wound diametrically across turns of an expanded helix. When each turn of the helix is completely covered with filaments, the helix is compressed and compacted. A shaft passage is then formed through the center of the helix to form the bearing.

3,722,052

METHOD OF FORMING A STRUCTURAL UNIT

Andrew J. Toti, 311 W. River Rd., Modesto, Calif.

Continuation of Ser. No. 888,717, Dec. 29, 1969, abandoned.
This application Jan. 21, 1972, Ser. No. 219,694
Int. Cl. B23p *17/00, 11/00*
U.S. Cl. 29—155 R **37 Claims**

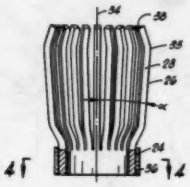


A method of forming a structural unit, such as structural beam comprised of a pair of opposed metal extrusions having preformed slot structures extending therealong in which edge portions of a pair of opposed sheet metal side wall members are secured by deforming certain of such members relative to the others so that secure interconnection is effected without requiring separate fasteners. The method disclosed employs predetermined lengths of the metal extrusions which are joined with substantially continuous lengths of sheet metal side wall panels into a unitary assembly which is subsequently cut to a predetermined length determined generally in accordance with the length of the extrusions employed.

3,722,053
METHOD OF MAKING WELL PRESSURE SEALING CUP REINFORCING STRUCTURE

Robert F. Berry, Dallas, and Henry W. Blackwell, Venus, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed July 26, 1971, Ser. No. 166,171
Int. Cl. B23p *15/16*
U.S. Cl. 29—163.5 **9 Claims**

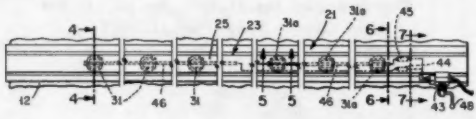


An improved reinforcing structure and method of making said structure are disclosed. The improved reinforcing structure is a polyfurcated cylinder having an integral base portion and a tines portion. The method of manufacture includes the steps of rolling a polyfurcated plate with an integral base and tines portion, rolling the base portion into a cylindrical shape and securing the abutting ends of the base.

3,722,054
HOLD-IN TRANSFER APPARATUS

Albert J. Bende, and Ralph L. Defalco, both of West Chester, Pa., assignors to Gindy Manufacturing Corporation, Dowingtown, Pa.

Filed Oct. 20, 1971, Ser. No. 190,873
Int. Cl. B23p *19/00, 11/00*
U.S. Cl. 29—200 J **4 Claims**



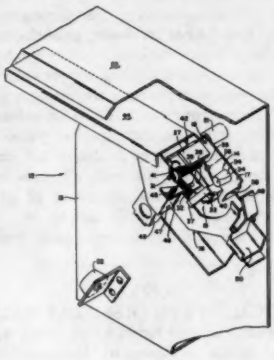
Apparatus for applying suction to a sheet while simultaneously applying a hold-in force to loose rivets contained in apertures in said sheet to enable the said sheet to be lifted and step-advanced so that the rivets so engaged may be threaded into apertures of a next adjacent sheet prior to heading the rivets to secure the said sheet and said next adjacent sheet together.

3,722,055
CARTRIDGE OPENING DEVICE

Anthony C. D'Ercole; James E. Ferris, both of Rochester, and David N. Schwardt, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 9, 1971, Ser. No. 178,955
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 D **9 Claims**

A device for breaking open a frangible cartridge which is adapted to contain a web, the cartridge being of the kind provided with spaced web supply and take-up chambers and with an interconnecting web guide channel. The device includes a fixture for engaging the web take-up chamber of such a cartridge in a manner preventing movement of the web take-up chamber in at least one direction and a guide surface which serves to direct the web take-up chamber into engaged relation with the fixture. An offset portion of the guide surface retains the web take-up chamber at the fixture. The device further includes a breaker lever which is mounted for movement relative to the fixture for moving, generally in the one direction, the web supply chamber and web guide channel of a

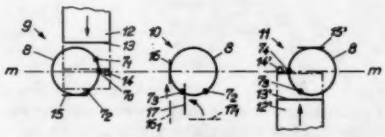


cartridge whose web take-up chamber is engaged by the fixture. Accordingly, the cartridge can be broken open for extraction of a web from the web take-up chamber.

3,722,056
KNOT SETTING DEVICE IN A FEED MECHANISM FOR HELICOIDAL WIRE SPRINGS

Walter Spuhl, Saint Gall, Switzerland, assignor to Spuhl Ag., Gallen, Switzerland

Filed Sept. 17, 1971, Ser. No. 181,382
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 A **12 Claims**



A feeding mechanism in which wire coils are supplied in succession between a pair of belts, clamped by the belts and fed stepwise by the belts until a given plurality of coils are accumulated, whereupon a number of such coils are removed together for assembly as a unit. Each coil has knots at its opposite ends and three mechanisms are arranged in sequence in the path of travel of the coils between the belts for angularly turning those coils located at one end of each of the units in stages in the pauses between stepwise advance of the belts so that such knots in the end coils face the other coils in the opposite direction.

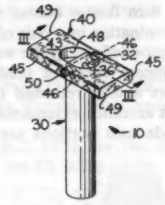
3,722,057
BEARING SERVICE TOOL

Dwaine R. Barnes, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 29, 1971, Ser. No. 184,725
Int. Cl. B23p *19/00;* **B21d** *53/10;* **B23p** *7/00*
U.S. Cl. 29—200 D **7 Claims**

A bearing service tool for removing and installing a sleeve-type half bearing, upon which is mounted the journals of an internal-combustion-engine crankshaft, without removing the crankshaft. The tool has an elongated rod selectively insertable into an angularly-disposed oil passage in the crankshaft. Pivotally mounted upon the rod is a bearing-engaging member which is capable of contacting an adjacent end of the half

bearing in intimate facing relationship therewith irrespective of the angular disposition of the particular oil passage in which

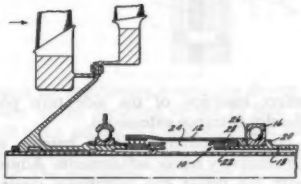


the rod resides to move the half bearing relative to its associated retaining seat as the crankshaft is rotated.

3,722,058
FASTENING DEVICE AND COOPERATING TOOL MEANS

Robert J. Corsmeier, Cincinnati, Ohio, assignor to General Electric Company

Filed Sept. 30, 1971, Ser. No. 185,321
Int. Cl. B23p *19/04*; F16c *43/00*
U.S. Cl. 29—200 D **8 Claims**



Fastening means include a threaded main body member and resiliently movable locking means for preventing relative rotation between the main body member and the shaft when the former has been threaded to its desired position on the shaft. Cooperating tool means are provided for installing and removing the fastener means and include inner and outer telescoped tools which are formed with radial ears which interfit with axially extending main body member lugs so as to grip and transmit torque to the main body member. The inner tool includes an annular portion which telescopes within the main body member to resiliently deflect the locking means during installation and removal.

3,722,059
MACHINE FOR MAKING A HEAT EXCHANGER TUBE

Herbert J. Venables, III, Cleveland, Ohio, assignor to The Venables Machine and Tool Company, Cleveland, Ohio

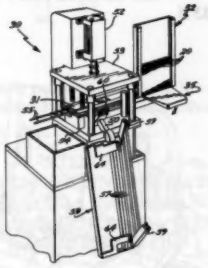
Filed April 19, 1971, Ser. No. 135,183
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 D **6 Claims**

Apparatus for forming spine-finned heat exchanger tubing is disclosed in which a strip of metal is slit at a first cutting station to provide intermediate spines having a width along the length of the strip equal to twice the desired spine width. The intermediate spines are then cut in half at a second cutting station. The apparatus for slitting the strip utilizes a main cutter roll in combination with two or more cutter rolls located at peripherally spaced locations. The depth of cut of alternate spines is varied to improve strength and heat flow characteristics. The tube is wound so that pairs of spines are axially offset from each other and peripherally diverging from the adjacent spine of an adjacent pair.

3,722,060
MACHINE

Floyd E. Gaiser, 1701 East Carnegie Avenue, Santa Ana, Calif.

Filed July 27, 1971, Ser. No. 166,530
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 D **15 Claims**

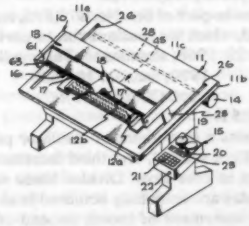


The present invention relates to apparatus for the mass production of modules; and more particularly to the mass production of electronic modules adapted for use in an printed circuit board. The present application discloses apparatus for mass producing such modules by feeding suitable carrier strip formations onto an indexing trackway, utilizing suitable indexing fingers for moving said carrier strips along said trackway, cutting and forming carrier strip portions to desired configurations, severing the carrier strips to produce individual modules, disabling said machine while the carrier strip is moving or is improperly positioned, delivering the severed finished modules along an output trackway into suitable shipping containers, and salvaging any scrap metal that may comprise precious metals thereon. Mechanism is disclosed for providing said indexing fingers with strictly vertical movement, so that the carrier strips are not inadvertently moved in a horizontal direction. A unit, with suitable flexibility for handling various types and numbers of modules, is disclosed.

3,722,061
WIRE WRAP PIN POINTERNONE

Lowell Bowles, 2236 Hauser Blvd., Los Angeles, Calif.

Filed Aug. 23, 1971, Ser. No. 173,913
Int. Cl. H05k *13/04*
U.S. Cl. 29—203 B **24 Claims**



An electromechanical pointer indicates the specific terminal board pin to which a wire is to be wrapped. The ap-

paratus comprises a ruled reference carriage driven along one axis to align a carriage ruler edge with the terminal board row containing the specific pin. A plurality of illuminable optical pointers, each comprising a lamp and an optical guide, are spaced along the ruler edge. One or more of the optical pointers is illuminated to indicate the specific pin to be wrapped. A photo-optical vernier permits the optical pointer lamps also to control positioning of the carriage along the one axis. A tool sensing light beam cooperates with the carriage control mechanism to indicate that the wire wrap gun has been correctly positioned at the appointed pin.

3,722,062

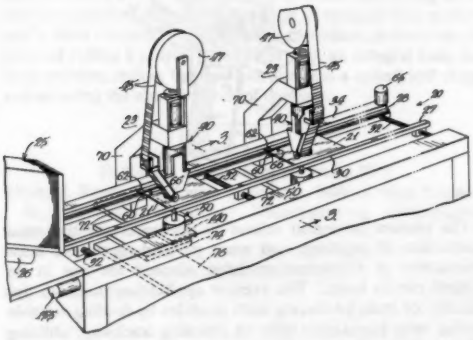
COMPONENT INSERTION SYSTEM

Hashem M. Gharaibeh, Palatine, Ill., assignor to Warwick Electronics Inc., Chicago, Ill.

Filed Nov. 4, 1971, Ser. No. 195,769

Int. Cl. H05k *13/04*

U.S. Cl. 29—203 B **19 Claims**



An indexing conveyor transfers circuit boards between spaced insertion stations at which alignment pins clamp the circuit boards to fixed reference positions. A component insertion head and a clinch mechanism are horizontally driven about two axes to a programmed insertion position, and then are vertically driven to perform an insertion operation. After each insertion station inserts a plurality of different components at different programmed positions, the alignment pins are withdrawn and the conveyor is indexed. The index conveyor and all insertion stations are controlled by a time-shared computer which stores, for each insertion station, a separate program comprising sets of numerical control movement commands.

3,722,063

APPARATUS FOR INSERTNG INSULATORS AND COIL TURNS INTO THE SLOTS OF A MAGNETIC CORE

Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

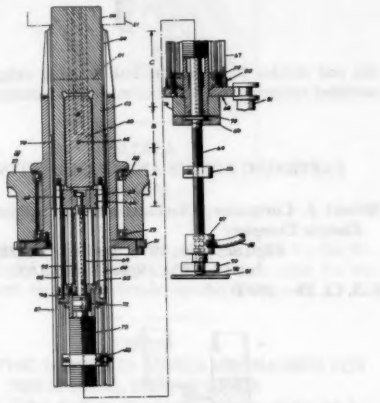
Continuation-in-part of Ser. No. 875,895, Nov. 12, 1969, abandoned, which is a continuation-in-part of Ser. No. 748,405, July 29, 1968, abandoned. This application Dec. 28, 1970, Ser. No. 101,638

Int. Cl. H02k *15/00*

U.S. Cl. 29—205 R **29 Claims**

A driver effects a movement of insulator pushers continuously through first, second, and third increments of travel to place insulators in core slots. Divider blade section and coil turn feeder blades are conjointly actuated in an axial direction during second increment of travel. At end of second increment of travel, divider blade section and coil turn feeder blades are extracted and extend through bore of the core. During third increment of travel, only insulator pushers and turn feeder blades are actuated. At end of third increment of travel, side turn portions of the electrical coil are inserted into predetermined pairs of slots. Relative movement of turn feeder blades and divider blade section reduces the frictional drag on coils. Coil turn feeder blades may be formed with reduced portions terminating in a pair of turn-pushing ledges with turn-receiving gaps defined by the walls of the elements.

Ledges may terminate short of feeder blade peripheral edges, and shoulders axially recessed from ledges may be used. Gaps form slot entrance extensions to receive side turn portions as other side turn portions are inserted. Shoulders



thereafter effect insertion of the side turn portions first received in the slot entrance extensions.

Magnetic cores of different stack heights are accommodated with relatively minor adjustments. Adjusting device associated with the driver can selectively control conjoint movement of divider blade section and turn feeder blades. Stop nut is also selectively and changeably mounted and selectively adjusts insulator pusher travel. This accommodates insulators of different lengths. Setting of stack height adjusting device and stop nut can be accomplished manually or automatically. Coils may be inserted when insulators are not being inserted.

3,722,064

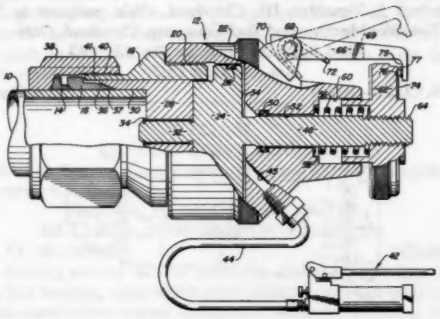
FERRULE SETTER WITH INDICATING MEANS

Leonard P. Spontelli, Seven Hills, Ohio, assignor to Crawford Fitting Company, Solon, Ohio

Filed April 15, 1971, Ser. No. 134,155

Int. Cl. B23p *19/04*

U.S. Cl. 29—237 **16 Claims**



A tool for swaging ferrules onto the periphery of a cylindrical member such as a tube or rod. The disclosed tool includes

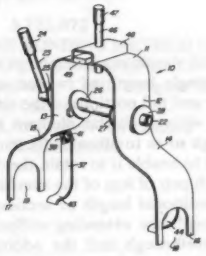
a frame for supporting and aligning the tube or rod with swaging means. The swaging means is shown as a ferrule camming member reciprocable with respect to the frame. Independently actuated signal means is adapted to indicate when adequate swaging has been accomplished.

3,722,065

APPARATUS FOR POSITIONING METERING DEVICES

Joseph Warren Harris, Vernal, Utah, assignor to C. R. Industries, Vernal, Utah

Filed Dec. 2, 1971, Ser. No. 204,050
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 **10 Claims**



An apparatus for positioning a metering device to facilitate the attachment of the metering device to feed lines located within a shaft has a generally U-shaped frame having a neck and two arms adapted to rest upon the horizontal portions of the feed lines. The apparatus has means interconnecting the two arms for varying the distance between the arms and has support means disposed between the arms and attached to the frame to support a metering device on the frame. An elongate member, preferably longitudinally extendable, is disposed at the neck of the frame for supporting the frame against the shaft walls in a predetermined position. In use, a metering device can be placed on the support means between the frame arms so that the input connection of the device can be positioned with respect to the feed line connections. The means interconnecting the frame arms is used to diminish the distance between the frame arms and thereby force the feed line connections against the threaded metering device connections for convenient attachment.

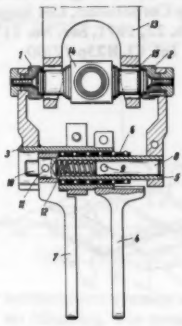
3,722,066

APPARATUS AND METHOD FOR ASSEMBLING UNIVERSAL JOINTS

Karl Spiess, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Aug. 4, 1971, Ser. No. 168,970
Claims priority, application Germany, Aug. 13, 1970, P 20 40 245.3
Int. Cl. B25b *27/14*
U.S. Cl. 29—271 **5 Claims**

A device for centering the spider trunnions in the eyes of the corresponding fork arms during the assembling of universal joints, said device comprising a pair of oppositely disposed holding members which extend from the outside into each of the annular spaces defined by the circumferential wall of the eye and the outer surface of the spider trunnions inserted therein and thereby center and hold a pair of spider trunnions in centered position within the eyes; and a process for assembling universal joints which comprises the steps of inserting the four spider trunnions into the respective fork eyes, centering a pair of oppositely disposed trunnions in the corresponding eyes with the aid of said centering device, clamping the other pair of trunnions in place, removing the centering device and mounting the roller bearings in the spaced between the eyes and the trunnions centered therein, removing the clamps



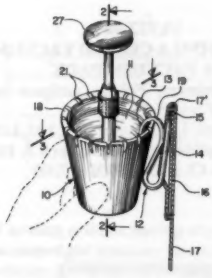
from the other trunnion pair and mounting the roller bearings in the spaces between the eyes and the said other trunnions.

3,722,067

DRAPERY HOOK PIN APPLICATOR

Mary B. Harkins, Vernon Road, Fayette, Ala.

Filed March 12, 1971, Ser. No. 123,797
Int. Cl. B25b *27/14*
U.S. Cl. 29—278 **3 Claims**



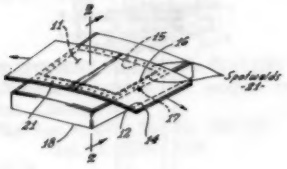
This applicator has a conical shaped handle that is opened and recessed at its forward end and is provided with an edge and forming in section generally to a hooked part of a hook pin having a series of grooves along the edge for receiving the loops of the hook pins to steady the same so that upon pushing the handle with the hook pin into the drapery the hook pin is thereby easily inserted without the use of fingers. In order to have the hook pins properly aligned relative to the upper edge of the drapery a measuring means extends from the open end of the handle and has a laterally extending portion on its upper end that can engage the upper edge of the drapery to locate the pointed end of the hook pin at the proper distance from the upper edge so that all of the hook pins assembled upon the handle will be inserted in accordance with the distance between the laterally extending plate portion, the measuring device and the point of insertion of the hook pin assembled upon the handle. A chuck means is used for providing for an adjustable measuring device in which the adjustable member has a stem that extends into the chuck device. The chuck device extends from a sleeve portion in the open end of the handle. The measuring device can thereby be adjusted for different distances of application of the pointed ends of the hook pins into the drapery material from the upper edge of the drapery.

3,722,068

METHOD FOR FORMING TITANIUM SHEETS

William E. Manchester, Lomita; Carl M. Morris, Manhattan Beach, and John L. Hill, Los Angeles County, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 22, 1971, Ser. No. 117,403
Int. Cl. B23p 17/00
U.S. Cl. 29—423 6 Claims



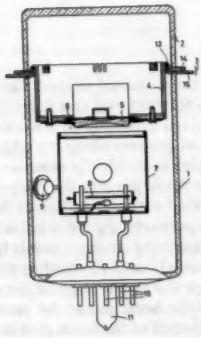
A method of forming titanium sheets and the like in which a sandwich structure consisting of a titanium sheet is placed in an envelope constructed of mild hot rolled steel, forming the sandwich structure utilizing a stretch forming operation, bracing the sandwich structure insuring that it will retain its shape during a stress-relieving operation, performing the stress relieving operation and removing the shaped titanium sheet from the envelope.

3,722,069

METHOD OF OPENING A CLOSED VACUUM VESSEL IN A VACUUM SPACE

Paul Leymonerie, Malmort, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed April 5, 1971, Ser. No. 131,149
Claims priority, application France, April 3, 1970, 7012088
Int. Cl. B23p 19/02, 17/00
U.S. Cl. 29—427 5 Claims



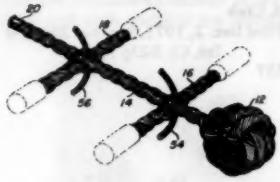
A method of opening a vacuum vessel in a vacuum space where the vessel is to be opened without producing undesired elements into the vacuum space. The walls of the vessel must comprise two parts that are connected together by means of a closure member having a U-shaped cross-section. The closure member is constructed of two flat rings that are connected at their inner edge. The method step comprises rotating the parts of the wall in opposite directions until the joining of the edges fractures.

3,722,070

METHOD OF MAKING ROPE FIGURE

Leo E. Shiner, 903 Alann Drive, Joliet, Ill.

Filed Aug. 1, 1969, Ser. No. 846,872
Int. Cl. B23p 19/04
U.S. Cl. 29—433 4 Claims



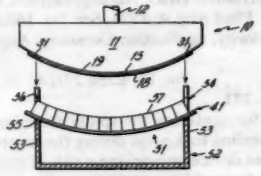
An animal simulating assemblage of rope components including a single length of twisted strand rope defining the neck, body and tail portions of the simulated animal and having a stiff wire or similar element extending longitudinally therethrough so as to afford sufficient stiffness to the twisted strand rope to enable it to retain the desired shape in which it is bent. Each pair of legs of the simulated animal formed comprises an additional length or section of twisted strand rope having a lengthwise extending stiffening wire or the like extending therethrough and the additional strand of rope is secured to the appropriate portion of the body defining section of rope. The free end of the neck defining end portion of the body rope section includes a rope knot defining an enlargement to simulate a head and the strands of the remote end of the body defining rope section may be unraveled and brushed to simulate a flag tail, if desired. Suitable eyes may be defined by fish bobbers, beads or the like attached to the head defining rope knot and the mouth or tongue of the simulated animal may be simulated by art foam. In addition, appropriate ears may also be formed of art foam or by opposite ends of a single rope strand inserted half-way through a single loop or a plurality of loops of the head defining knot and the opposite ends of the single strand may be brushed in order to simulate shaggy ears if desired.

3,722,071

BRAZING POWDER DEPOSITION METHOD

John R. Van Orsdel, Columbus, Ohio, assignor to Aeronca, Inc., Middleton, Ohio

Division of Ser. No. 26,629, April 8, 1970, abandoned. This application Sept. 30, 1971, Ser. No. 185,363
Int. Cl. B23k 31/02
U.S. Cl. 29—471.1 5 Claims



Apparatus and method, in preferred form, particularly adapted for evenly depositing a brazing powder at the interface of a honeycomb sheet and a substrate. The apparatus is comprised of a head having a working face defined by a porous medium, the medium permitting suction therethrough but preventing powder from passing therethrough. The face of the head is provided with shims of a preselected thickness, that thickness being dependent on the weight of powder per

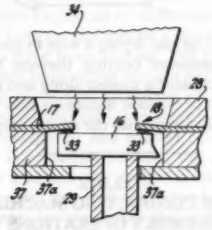
unit area to be deposited. In use, a partial vacuum is established on one side of the head's working face and the powder to be deposited is placed on the other side of the face, the powder thereby being held to the face. A definite and reproducible powder thickness is established by scraping excess powder off the face through use of a knife edge in cooperation with the shims. The honeycomb sheet is preliminarily fixed to the substrate such as, for example, by tack-welding. Thereafter, the powder-coated face of the head is positioned over the honeycomb sheet and the vacuum released. This allows the powder to drop from the head's working face through the honeycomb cells onto the substrate surface. Such results in an even distribution of powder on the exposed area of the substrate, and is a practical method of achieving such distribution in that no skilled operator is required.

3,722,072

ALIGNMENT AND BONDING METHOD FOR SEMICONDUCTOR COMPONENTS

Fritz W. Beyerlein, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Nov. 15, 1971, Ser. No. 198,813
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 **9 Claims**



A method for bonding semiconductor structures of the type including semiconductor devices and bonding pads to lead structures. A semiconductor wafer containing a plurality of the lead structures is adhesively secured to a perforated die carrier with the wafer aligned so that a perforation underlies each semiconductor structure. The semiconductor wafer is then separated into individual semiconductor structures. An indexing mechanism positions the die carrier and hence the wafer so that one of the semiconductor structures is aligned with a bonding position. Another indexing mechanism positions a sheet of lead structures so that one of the lead structures is aligned with the bonding position. Due to orientation of the die carrier and the sheet of lead structures the bonding pads of the semiconductor structure in the bonding position are aligned with the spaced leads of the lead structure and the bonding position. A vacuum chuck travels up through the perforation in the die carrier and carries the semiconductor structure to the lead structure where it is bonded.

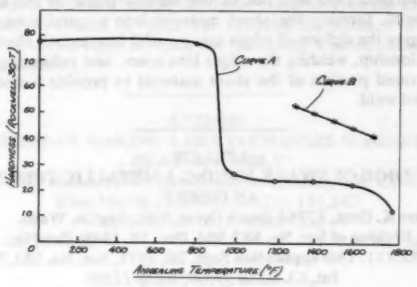
3,722,073

PRODUCTION OF PRODUCTS DIRECTLY FROM NICKEL CATHODES

Floyd Gotthard Larson, Jr., Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 1, 1971, Ser. No. 185,716
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.3 **7 Claims**

A method of producing a unitary piece from a pack of nickel cathodes, comprising hot working said pack to reduce its thickness by about **75** percent or more. Preferably, the hot working is carried out on such cathode packs heated to about **1600°F.** to **2200°F.** or higher, reductions of **92** percent or **96** percent or more being desirable. Certain embodiments permit the unitary piece to be cold worked and annealed to low hardness at temperatures as low as about **950°F.**, while various other embodiments permit annealing of the cold worked



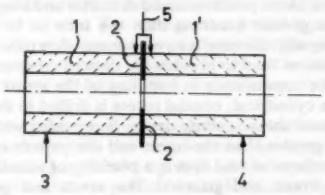
material at higher temperatures even up to **1800°F.**, or higher, with substantially no blistering. The present method lends itself to producing nickel strip, such as that suitable for coinage manufacture, from cathode nickel without melting.

3,722,074

METHOD OF SEALING A METAL ARTICLE TO A GLASS ARTICLE IN A VACUUM-TIGHT MANNER

Johannes Theodorus Klomp, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed April 13, 1970, Ser. No. 27,605
Claims priority, application Netherlands, April 21, 1969, 6906150; Oct. 25, 1969, 6916130
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.9 **5 Claims**



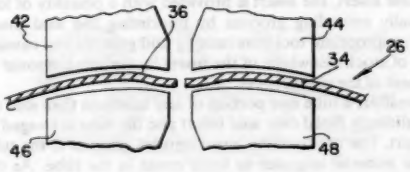
A method of sealing articles having metal and glass sealing surfaces in a vacuum-tight manner. The joint is established by heating the surfaces under pressure until welding occurs at temperatures which are lower than the softening point of the glass and which lie between the temperature at which the vapor tension of the metal is equal to 10^{-10} Torr and the temperature which is the melting point of the metal.

3,722,075

METHOD FOR CONTINUOUS PRODUCTION OF SPIRAL PIPE

James Eugene Fay, 4204 Nelson Rd., Middleton, Ohio

Filed Jan. 19, 1971, Ser. No. 107,748
Int. Cl. B23k *31/02*
U.S. Cl. 29—477.3 **9 Claims**



A method and apparatus for continuously producing spiral pipe from sheet material including feeding a strip of the sheet

material into a spiral pipe forming machine, continuously deforming a portion of the longitudinal edges of the sheet material so as to bend the edge downwardly toward the axis of the formed pipe and out of the normal plane of the sheet material, forming the sheet material into a spiral tube and bringing the deformed edges into parallel face to face abutting relationship, welding the edges into seam, and reforming the deformed portion of the sheet material to provide a smooth forged weld.

3,722,076

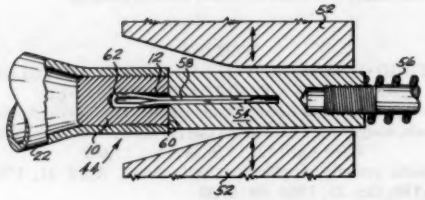
METHOD OF SWAGE JOINING A METALLIC TUBE TO AN INSERT

Robert K. Dent, 17765 Beach Drive, N.E., Seattle, Wash.

Division of Ser. No. 883,904, Dec. 10, 1969, Pat. No. 3,652,111. This application Sept. 20, 1971, Ser. No. 181,725

Int. Cl. B21d *39/00*; B23p *11/00*

U.S. Cl. 29—516 **6 Claims**



There is disclosed an insert of cylindrical shape and of substantially uniform predetermined diameter and length. This insert has a greater hardness than the tube to be employed. Thus, generally, the tube is an aluminum alloy tube and the insert is stainless steel to provide the desired comparative hardnesses. For convenience in handling of the insert during the process, a cylindrical, coaxial recess is drilled in the insert. A conventional thread-rolling device is provided with dies of a hardness greater than the insert and the pattern on the contacting surfaces of said dies is a plurality of annular, spaced, alternate crests and grooves. The crests and grooves are disposed in two longitudinally spaced sections and with the grooves and crests in the first section each having a common diameter and with the diameters of the crests and grooves in the second section each having gradually decreasing diameters. Such dies are used to form a pattern of annularly spaced grooves and crests on the surface of the insert. The crests in the first section of the dies imprint grooves in a first section on the insert and which grooves have a common diameter. The material displaced in the insert, in the imprinting and forming of such grooves, migrates laterally from the grooves or in a direction longitudinally of the insert and forms the crests of uniform diameter in the first section on said insert. The crests in the second section of the dies imprint grooves in a longitudinally spaced second section on the insert and which grooves have gradually increasing diameters. The material displaced in forming said grooves in said second section of said insert forms crests which are not fully formed and which gradually decrease in diameter. Next, the prior to swaging of a tube upon said insert, the insert is provided with a plurality of longitudinally extending grooves by imprinting the said insert with an appropriate tool thus causing said grooves and causing a raise of stock elsewhere of the insert by the same amount as the extent of the said grooves.

Thereafter, a tube end portion of less hardness than said insert is slidingly fitted over said insert and the tube is swaged to the insert. The crests of the insert imprint grooves in the tube and the material migrates to form crests in the tube. As the crests of the insert were formed by metal migrating from grooves to form the same, the said crests of said insert will cause grooves and concomitant migration of metal to form precisely the crests in the tube. In order to ensure against any possible slight voids, there is provided a slight migration over that necessary to form the crests in the tube mating with the grooves on the insert and the longitudinally extending ridges mating with the longitudinally extending grooves of the insert. This swaging provides for cold working of the aluminum of the tube and improves the strength qualities thereof.

3,722,077

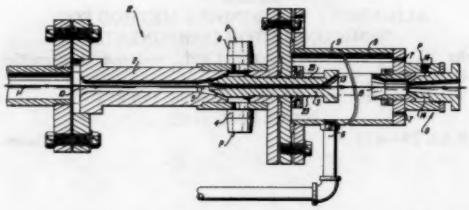
METHOD OF COOLING AND DRYING A WIRE UTILIZING AN INDUCED AIR WIPE

Robert T. Armstrong, Villa Rica, Ga., assignor to South Wire Company, Carrollton, Ga.

Filed March 5, 1971, Ser. No. 121,456

Int. Cl. B23p *17/00*

U.S. Cl. 29—527.4 **6 Claims**



A process of cooling and drying a wire in preparation for the extrusion of an insulated coating thereon wherein a high velocity stream of coolant is passed along and around the wire. The flowing stream of coolant induces a flow of drying medium which thereby accomplishes the drying step.

3,722,078

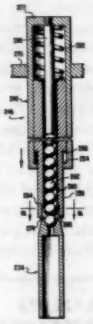
METHOD FOR CONDUCTING MACHINING AND ASSEMBLY OPERATIONS

John A. Cupler, II, 10 Cupler Dr., Lavale, Md.

Division of Ser. No. 868,517, Oct. 22, 1969, Pat. No. 3,663,998. This application March 4, 1971, Ser. No. 121,213

Int. Cl. B23p *13/04*

U.S. Cl. 29—557 **6 Claims**



The disclosure is directed to a vertically oriented automatic tool changer employing non-captive tools for performing machining and/or assembly operations at a plurality of work locations on a single workpiece which workpiece is supported by a work positioner capable of infinite adjustment to present any desired number and spacing of work locations, on the workpiece, to the working axis of the non-captive tools.

A method for performing machining and assembly operations on a work piece is also disclosed. One of a number of non-captive machining or assembly tools is positioned in a

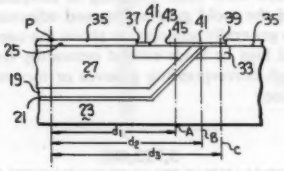
non-captive bearing and advanced toward the work piece to perform an operation thereon. Upon completion of the operation, the first tool is withdrawn from the work piece and interchanged with a second tool which is subsequently advanced toward the work piece to perform another operation.

3,722,079

PROCESS FOR FORMING BURIED LAYERS TO REDUCE COLLECTOR RESISTANCE IN TOP CONTACT TRANSISTORS

James D. Beasom, Indian Harbor Beach, Fla., assignor to Radiation Incorporated,, Melbourne, Fla.

Filed June 5, 1970, Ser. No. 43,789
Int. Cl. B01j *17/00*
U.S. Cl. 29—578 **15 Claims**



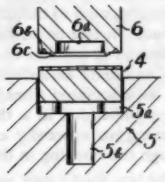
A buried layer in an integrated circuit structure is formed by one-step deposition (epitaxial or diffusion) of heavily doped silicon over the bottom surface of a wafer in which island-separating moats have been etched. The buried layer is thus uniformly provided both at the bottom and along the sides of the finished islands. In the formation of a transistor in the island, a collector contact diffusion layer is diffused through a mask aperture configured and spaced relative to the island center to assure intersection between this diffusion layer and buried layer. In addition the collector contact is deposited through another mask aperture spaced and configured relative to the island center to assure that the collector contact is in contact only with the portion of the collector contact diffusion layer residing within the island edges.

3,722,080

METHOD FOR PRODUCING THE BASE OF A SEMICONDUCTOR DEVICE

Yoshio Sato, 42-32 Ogikubo, 2-chome, Suginami-ku Tokyo, Japan

Filed Nov. 12, 1971, Ser. No. 198,158
Claims priority, application Japan, Nov. 16, 1970, 45/100239; Jan. 29, 1971, 46/2856
Int. Cl. B21k *23/00*; H01l *17/00*
U.S. Cl. 29—581 **4 Claims**



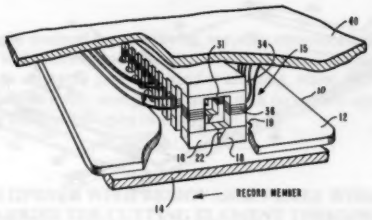
In a method for producing the base of a semiconductor device from a composite metal workpiece comprising a lower metal layer possessing high electric and thermal conductivities and an upper metal layer clad on the lower metal layer and possessing high electric resistance suitable for electric resistance welding, a semiconductor pellet or element mounting raised portion formed in the workpiece as the workpiece is deformed to a predetermined final base shape is removed the upper metal layer therefrom so as to expose the lower metal layer on the upper surface of the raised portion whereby the exposed metal layer is ready for directly mounting a semiconductor pellet thereon. Alternatively, the workpiece is deformed so as to elongate the upper metal layer in the raised portion to reduce its thickness whereby the surface of the thinned metal layer is ready for mounting a semiconductor pellet thereon.

3,722,081

METHOD OF MAKING A MULTI-CHANNEL MAGNETIC HEAD ASSEMBLY

Samuel C. Neace, 95440 Henderson Ave., Sunnyvale, Calif.

Filed March 22, 1971, Ser. No. 126,565
Int. Cl. G11b *5/42*; H01f *7/06*
U.S. Cl. 29—603 **8 Claims**



A multi-channel magnetic head assembly for non-contact usage comprises a pair of essentially unitary structures joined along a common plane. A first of the structures comprises a plurality of pole tip elements, formed from a single element and affixed within individual slots to a slotted air bearing element. The individual pole tip elements bridge, at the common plane, individual core legs having a common base and joined to a small circuit board. The arrangement provides precise gap depth, virtually zero gap scatter, and an effective gap length that correspond to the physical length. The head also minimizes change of head position, and is extremely small and of low mass.

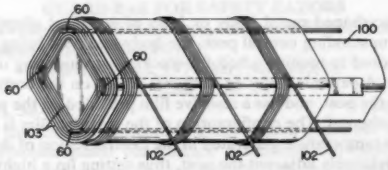
Methods of making multi-channel, non-contact head assemblies in accordance with the invention are based upon readily automated cutting and finishing steps. A unitary pole tip assembly is formed from a pair of block elements with an interposed non-magnetic spacer. Interchannel grooves are cut across the gap, forming a comb-like structure which is inserted into and affixed to a slotted air bearing element. The base of the comb-like structure is then ground away to a selected reference plane. The multiple pairs of core legs are formed by grooving a unitary magnetic block in two directions and this base structure is then joined to the pole tip elements.

3,722,082

METHOD OF MAKING ELECTRICAL TRANSFORMER MEANS

John Hoell, Cincinnati, Ohio, assignor to Foster Transformer Company, Cincinnati, Ohio

Continuation of Ser. No. 839,124, May 15, 1969, which is a division of Ser. No. 605,265, Dec. 28, 1966, Pat. No. 3,500,273. This application July 22, 1971, Ser. No. 165,358
Int. Cl. H01f *7/06*
U.S. Cl. 29—605 **3 Claims**



This disclosure relates to improved electrical transformer means which has heat transfer surface means for transferring

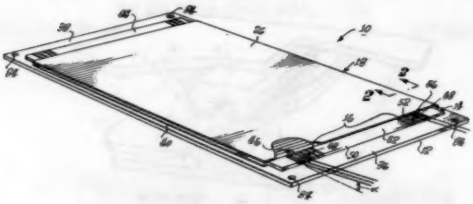
heat outwardly from within electrical coil means of such transformer means to thereby provide optimum electrical performance and to an improved method of making such transformer means and associated coil means.

3,722,083

METHOD OF MAKING A PLATED WIRE MEMORY PLANE

Wendell C. Johnson, Topanga Canyon; Nicolas G. Gomez, Los Angeles, and Claude H. Foret, Culver City, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 15, 1971, Ser. No. 106,839
Int. Cl. H01f 7/06
U.S. Cl. 29—604 **13 Claims**



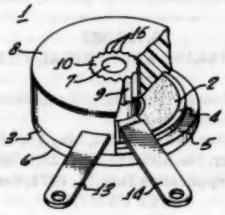
A plated wire memory plane includes a support member, an insulator having a plurality of parallel grooves, a plated wire comprising a conductive wire substrate, an annular magnetic coating uniformly deposited in generally all of the preformed grooves, and a substantially U-shaped word drive line laminate. One leg of said word drive line laminate is positioned between the grooved insulator and the support member. The second leg of the word drive line laminate is positioned to overlie the upper surface of the grooved insulator.

3,722,084

METHOD OF MAKING POWER RESISTORS

Richard E. Caddock, 640 Sandalwood Ct., Riverside, Calif.

Division of Ser. No. 40,281, May 25, 1970, Pat. No. 3,636,493, which is a continuation-in-part of Ser. No. 847,783, July 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 820,538, April 30, 1969, abandoned. This application Sept. 23, 1971, Ser. No. 183,139
Int. Cl. H01c 17/00
U.S. Cl. 29—610 **14 Claims**



A disc-shaped metal body or base of anodized aluminum has an upstanding central post, the body and post being centrally bored to receive a bolt for stacking or mounting of the resistor. A ceramic wafer or washer is seated on the body and around the post, and has a resistive film provided on the upper surface thereof. The configuration of the resistive film is such that the temperature generated in the central region of the resistor, relatively adjacent the post, thus setting up a highly effective thermal gradient which maximizes the dissipation of heat from the resistor. Terminal lugs or leads connect to the resistive film and extend outwardly generally in the plane of the washer, there being a connection between each lug and the washer by means of a rivet the ends of which are embedded in thermosetting synthetic resin. All of the components are maintained protected from the environment by a mass of thermosetting synthetic resin which extends upwardly from the film and surrounds the post, the upper surface of the resin being flush with the top of the post and parallel to the bottom of the metal body, in order to permit stacking of the resistors. The body and/or central post incorporate undercut means to prevent axial and rotational movement of the resin relative to the body, despite high thermal and other stresses.

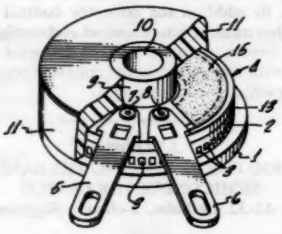
In accordance with the method, the pre-assembled body and ceramic washer (bearing the resistive film) are mounted as inserts in a mold cavity the depth of which is approximately equal to the distance between the upper end of the post and the bottom surface of the metal body. Thus, despite the absence of a plug in the central bore in the post, no molding material enters such bore. Molding is effected by transfer molding, and the mold gate is disposed adjacent the parting line and also generally adjacent or above the ceramic washer. The terminal lugs or leads extend outwardly from the mold cavity through corresponding grooves or recesses located at the parting line.

3,722,085

METHOD OF MAKING FILM-TYPE POWER RESISTORS

Richard E. Caddock, 640 Sandalwood Court, Riverside, Calif.

Division of Ser. No. 40,308, May 25, 1970, Pat. No. 3,649,944, which is a continuation-in-part of Ser. No. 847,783, July 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 820,538, April 30, 1969, abandoned. This application Sept. 23, 1971, Ser. No. 183,113
Int. Cl. H01c 7/00, 17/00
U.S. Cl. 29—620 **19 Claims**



A film-type power resistor consists of a ceramic wafer or washer having a central opening, one side of such washer being printed at its outer and inner edges with generally annular traces of termination metal. An electrically resistive film is printed on such one side over all portions of, and between, the termination metal, excepting for predetermined adjacent end portions which are connected to radially outwardly extending terminal lugs or leads. In one embodiment, the metal traces are continuous, whereas in another embodiment they are interrupted in order to create series-related resistor portions. The washer (and its associated films) are mounted over a metal base and are embedded in a thermosetting synthetic resin, the base having an upwardly extending central post which passes through the opening in the washer to the upper surface of the resin.

In accordance with the method, the planar surface of a ceramic substrate is first printed with termination film traces, following which such traces are overprinted with electrically resistive film. The ceramic (with its associated coatings) is then fired in order to cure the resistive film. Thereafter, the entire outer surface of the resistive film is uniformly abraded by means of a jet of abrasive particles, the abrading continuing in a uniform manner until the resistive film is within the required tolerance. During the abrading step, the terminal regions of the terminal film traces are masked. Thereafter, terminal lugs or leads are connected to such terminal regions.

3,722,086

PROCESS FOR MAKING FLOOR MAT SWITCHES

Lance A. Wikkerink, Greendale, and Lee R. Wikkerink, West Allis, both of Wis., assignors to Lanson Industries, Inc., Milwaukee, Wis.

Filed Aug. 21, 1970, Ser. No. 65,873
Int. Cl. H01h 11/00, 11/02, 11/04
U.S. Cl. 29—622 9 Claims

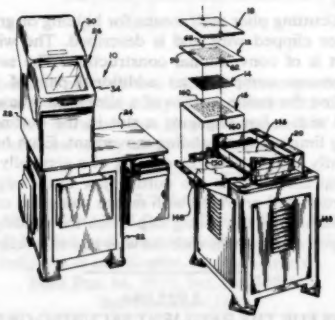
To make a floor mat switch, a large O-ring seal is held out adjacent the periphery of one contact plate and rubber separator discs are cemented to the surface of the plate at evenly spaced intervals. A second contact plate is laid on the O-ring seal and spacer discs and the space between the two plates is evacuated. A vinyl spacer ribbon is wound about the plates. The two plates are then suspended in a composite mold in an oven, centered by the spacer ribbon. Liquid vinyl is pumped into the mold and heat cured about the plates.

3,722,087

METHOD AND APPARATUS FOR MOUNTING TERMINALS ON A CIRCUIT BOARD

Quentin Berg, New Cumberland, Pa., assignor to Berg Electronics, Inc., New Cumberland, Pa.

Filed Oct. 15, 1971, Ser. No. 189,683
Int. Cl. H05k 13/04
U.S. Cl. 29—626 12 Claims



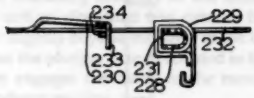
Loose piece eyelets are wiped back and forth across the top of a tilted transfer plate having eyelet receiving holes therein. An air flow is maintained through the holes in the transfer plate to seat the eyelets in the holes. A circuit board is positioned in a press on top of an anvil plate and the loaded transfer plate is mounted on top of the circuit board. Closing of the press moves a punch plate toward the transfer plate to force the eyelets from the transfer plate into holes in the circuit board and bring the lead ends of the eyelets into engagement with anvils on the anvil plate to stake the eyelets to the circuit board. Eyelets can be staked to the circuit board in holes off center with respect to the staking tooling.

3,722,088

METHOD FOR FUNCTIONABLE STRUCTURAL ACCOMMODATION OF SNAP-IN ELECTRIC LAMPS

John J. Horan, 420 Quigley Ave., Willow Grove, Pa.

Division of Ser. No. 584,031, Sept. 7, 1966, Pat. No. 3,523,274. This application Dec. 8, 1969, Ser. No. 888,214
Int. Cl. H02g 15/00; H05k 3/30
U.S. Cl. 29—629 9 Claims



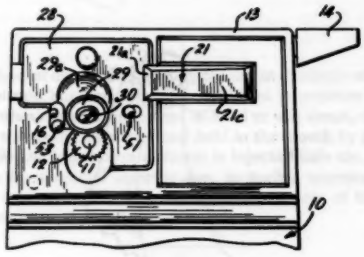
A simple method for modifying metallic structures, such as those of instruments and vehicles, as well as those of buildings, to provide dilatable gaps therein for aligning, elastically holding, and electrically energizing lamps of a new push-insertion category designed to snap into position.

3,722,089

CAN OPENER WITH REMOVABLE PLATE WHICH CARRIES THE CUTTING ELEMENT THEREON

Robert E. McLean, Raytown, and Joseph J. Farkas, Kansas City, both of Mo., assignors to Rival Manufacturing Company

Filed Aug. 28, 1970, Ser. No. 67,677
Int. Cl. B67b 7/38
U.S. Cl. 30—4 R 8 Claims



A can opener has a mounting plate which is positioned adjacent the forward face of the can opener frame. The cutting element for the can opener is carried on a plate which is removably attached thereto by a mortise-tenon combination at one side of the plate and by a spring biased latch on the opposite side. The plate is further biased outwardly from the frame to assure proper clearance between the cutting element and the can feed wheel at all times.

3,722,090

GUARD BAR FOR SAFETY RAZORS

Jan Dawidowicz, Fairfield, Conn., assignor to Warner Lambert Company, Morris Plaines, N.J.

Filed Aug. 12, 1971, Ser. No. 171,075
Int. Cl. B26b 21/00, 21/14
U.S. Cl. 30—32 11 Claims

The disclosure is directed to a safety razor guard bar having a continuous guard bar surface positioned outwardly and below the cutting edge of a razor blade. The continuous guard bar surface is provided to fix the cutting angle of the blade, and to smooth and stretch the skin prior to its engagement with the cutting edge of the blade. The guard bar includes a

plurality of ridges spaced along the upper surface thereof. Each of the ridges has an outer arcuate surface extending from

the continuous guard bar surface upwardly and inwardly to beneath the blade such that the upper portion of each of the ridges is in close proximity to the cutting edge of the blade.

3,722,091

DISPOSABLE SAFETY ROTARY RAZOR

Rudolph A. Gagnon, Key West, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,580

Int. Cl. B26b *21/24*, *21/54*

U.S. Cl. 30—40 **1 Claim**

A cylindrical hollow sleeve has an axial slot and a handle extending at right angles. An elongated member is detachably disposed in the sleeve and is manually rotatable about its axis. The member carries a plurality of cutting means which are successively indexed at the slot for shaving.

3,722,092

CABLE SHEATH CUTTING APPARATUS

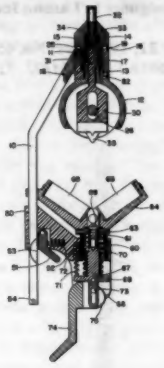
Helmut Hans Lukas, Carleton Place, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottowa, Ontario, Canada

Filed Sept. 27, 1971, Ser. No. 183,892

Int. Cl. B21f *13/00*

U.S. Cl. 30—90.9 **11 Claims**

A tool for removing the sheath from cables. A cutting edge is positioned between two serrated drive rollers which engage with the cable periphery. Opposed to the drive rollers are support rollers. The drive rollers are rotated to move the tool on



the cable. The drive rollers and cutting edge can be arranged to cut axially of the cable or circumferentially.

3,722,093

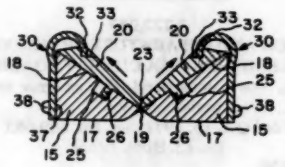
WIRE CUTTING PLIER WITH SEVERED END HOLDING MEANS

Harry Kaufman, 44 Highridge Road, New Rochelle, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,160

Int. Cl. B26b *13/22*

U.S. Cl. 30—124 **8 Claims**



A wire cutting plier with means for holding or gripping the severed or clipped wire end is described. The wire cutting plier part is of conventional construction. The severed end holding means comprises an additional pair of jaws each mounted on the inside surface of a plier cutting jaw and each provided with a bar engaging a slot in the cutting jaw and providing limited lateral sliding movement. Each holding jaw is resiliently held in place by one leg of a generally U-shaped spring clip anchored to the cutting jaw outer edge along a bight portion and provided with means along the other leg to prevent turning of the spring clip when the holding jaws are moved upon engagement with the wire end to be clipped.

3,722,094

MEANS FOR THE RESILIENT SECURING OF TOOTH SUBSTITUTES

Karl Heinz Rivoir, 15 Kiehnlestrasse, 753 Pforzheim, Germany

Filed Aug. 27, 1970, Ser. No. 67,394

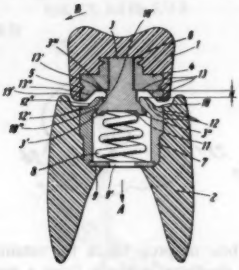
Claims priority, application Germany, Aug. 29, 1969, P 19 43 932.8

Int. Cl. A61c *13/00*

U.S. Cl. 32—2 **10 Claims**

Means for the resilient and preferably releasable mounting of tooth replacements or substitutes, particularly individual teeth in a plate or bridge or the like, where elastic yielding in axial as well as radial direction is possible, and where a sup-

port member is provided on the tooth which engages a supporting housing of the plate or the like with axial and radial tolerance, and between supporting member and supporting housing an axially and radially effective supporting spring or other elastically effective member is provided and the supporting member and the supporting housing having corresponding sliding, rolling or other engagement surfaces that permit a laterally directed tilting or relative movement and an axial movement between the supporting member and supporting housing.



3,722,095

TAKE-UP SYSTEM FOR DENTAL UNITS AND THE LIKE

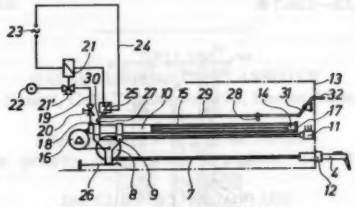
Helmut Richard Pletschmann, Karlsruhe-West, Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed March 9, 1971, Ser. No. 122,436

Claims priority, application Germany, March 10, 1970, P 20 11 198.2

Int. Cl. A61c *19/02*

U.S. Cl. 32—22 **6 Claims**



The invention pertains to a take-up system particularly for dental units in which the utility lines connected to the treating instrument are retracted into the unit by means of a movable pulley which is moved by an air driven piston.

3,722,096

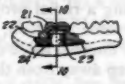
MEANS TO HOLD DENTURES IN PLACE

Rudolph J. Kopfer, and John A. Gaylord, both of Greenbrae, Calif., assignors to said Kopfer, by said Gaylord

Filed Dec. 16, 1971, Ser. No. 208,656

Int. Cl. A61c *13/00*

U.S. Cl. 32—3 **5 Claims**



In a denture at least two of the molars are formed by an outer casing holding a reciprocable tooth which is normally pushed outward by a spring adjusted according to the suction required to hold the denture on the tissue of the mouth; the chamber in the outer casing is connected by passages to suction pockets in the tissue side of the denture; each pocket is covered with screens to prevent the sucking of the tissue into the pockets; as the mouth is closed and the teeth are pressed into the respective casings, water is expelled from the pockets and the resulting vacuum sucks the tissue against the screens of the pockets and holds the denture in position; another form of the invention has the plunger in a chamber formed inside of the tooth and extending inwardly of the denture in an elongated pocket and an elongated tray extends from the bottom of the plunger slightly beyond the level of the tissue side of the denture so that the plunger is reciprocated in the chamber and when the tray engages the tissue in the mouth it expels the liquid and produces suction.

3,722,097

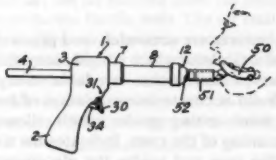
METHOD AND MEANS FOR MAKING DENTAL IMPRESSIONS

Albert J. Colman, 427 North Camden Drive, Beverly Hills, Calif.; Paul I. Zandberg, 8202 Romaine Street, Los Angeles, Calif., and Charles F. Taylor, 150 East Industry, LaHabra, Calif.

Filed Dec. 4, 1970, Ser. No. 95,100

Int. Cl. A61c *9/00*

U.S. Cl. 32—17 **17 Claims**



A method of impression making for use in dentistry wherein a clear plastic impression tray is stabilized in position in the mouth without any impingement of hard or soft tissue, the impression tray being stabilized and held in the mouth by the patient while the impression material is injected into the stabilized tray by a special injector gun, in such a manner as to produce an impression with neither displacement of the soft tissue, nor entrapment of any air or saliva.

3,722,098

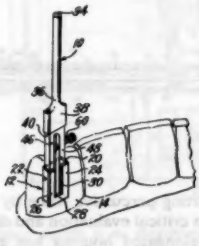
DENTAL MANDREL

Melvin D. Poveromo, 1160 Kane Concourse, Suite 203, Miami Beach, Fla.

Filed April 20, 1972, Ser. No. 245,943

Int. Cl. A61c *13/22*

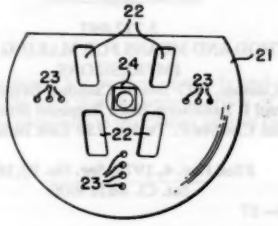
U.S. Cl. 32—5 **3 Claims**



A dental mandrel for placement and positioning of the female attachment portion of a dental bridgework or the like has a stem with depending tines to set within the attachment.

The tines are provided with means whereby they spread outwardly to frictionally engage the attachment, and are also adapted for movement inwardly whereby the mandrel is easily engaged and disengaged from the attachment without disturbance of its position.

3,722,099
METHOD OF ACCURATELY AND PRECISELY CONSTRUCTING ARTIFICIAL DENTURES
Bernard Jankelson, 1451 Medical-Dental Bldg., Seattle, Wash.
Filed Feb. 22, 1971, Ser. No. 117,542
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **9 Claims**

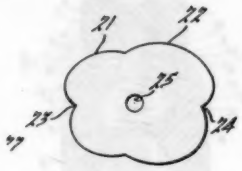


Artificial dentures are accurately and precisely constructed using a dental articulator which is rigid, nonyielding and which stores, preserves and makes available every determinant required to build accurate intercuspation of teeth. A unique transparent tooth-setting guide which allows rapid "see-through" mounting of the casts, indicates the size of the teeth suitable for the case and guides the placement of the teeth. With the dental articulator and transparent tooth-setting guides dentures are constructed by (1) establishing the occlusal plane on the biterim or on the teeth, (2) mounting the lower cast on the articulator in a manner to preserve the plane of occlusion, the mounting making use of the transparent tooth setting guide, (3) mounting the tooth-setting guide to the lower cast, (4) mounting the lower cast to the articulator, (5) mounting the upper cast and (6) arranging the teeth in the casts.

3,722,100
TOOTH PERCUSSION INSTRUMENT
Manuel I. Weisman, 735 Oberlin Avenue, Augusta, Ga., and Ira Klinger, 3222 York Drive, Augusta, Ga.
Filed Sept. 8, 1971, Ser. No. 178,569
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **2 Claims**

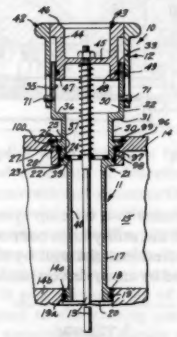
A device for imparting percussive force by dentists or the like to a tooth used in critical evaluation and differential diagnosis, in which an elongated housing has a spring biased plunger with graduated positions of force application. The plunger is controlled by a release mechanism, and visually observable indicia correlated to the degree of force applied is provided.

3,722,101
DENTISTRY BITE OR PROP BLOCK
William F. Via, Jr., P. O. Box 2006, Chapel Hill, N.C.
Filed March 1, 1971, Ser. No. 119,717
Int. Cl. A61c *3/00*
U.S. Cl. 32—40 R **7 Claims**



A disposable bite or prop block for retaining the mouth open for use in dentistry is made from a non-elastic foam plastic material into which the cusps on the bicuspid and molar teeth at one side of the mouth can indent to prop open the mouth and provide a fixed cavity in which dental work can be performed. The patient rests his teeth at one side of the mouth on the block to permit the teeth on the opposite side to be worked on freely in the large cavity provided. The block or prop is constructed to have different cross sectional dimensions so that the mouth can be retained opened to different degrees without fatigue to the jaw muscles.

3,722,102
DIP STICK
Richard H. Jackson, Downers Grove, and Harry B. Bak, Westchester, both of Ill., assignors to Gits Bros. Mfg. Co., Inc., Chicago, Ill.
Filed Feb. 24, 1971, Ser. No. 118,284
Int. Cl. G01f *23/04*
U.S. Cl. 33—126.7 R **6 Claims**



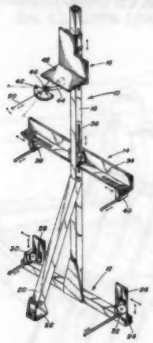
A dip stick assembly with a tubular body having an internal ledge of a fixed position and a cup-shaped external opened end with a closure cap adapted to close the end, the closure cap having an axial groove receiving the cup-shaped opening of the tubular body, a dip stick fastened to the cap, a bayonet connection between the cap and the body allowing axial movement of the cap with respect to the body, the dip stick having a spring means around the upper portion thereof, the spring means contacting a radial projection member on the dip stick axially movable thereon, the radial projection adapted to contact the internal ledge on the body wherein the spring will force the cap away from the body to maintain the dip stick normally at a given level while depressing the cap towards the body will move the dip stick axially within the body to a measuring level, the spring cooperating with the bayonet lock to maintain the cap securely fastened to the body.

3,722,103

ADJUSTABLE ANTHROPOMETER

Harvey G. Gregoire, Patuxent River, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 1, 1970, Ser. No. 111,384
Int. Cl. A61b 5/10
U.S. Cl. 33—174 D 5 Claims



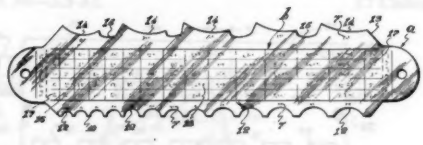
An anthropometric device designed to provide accurate measurements for evaluation of crew station design. The device can be adjusted to simulate various anthropometric dimensions. Modified retractable tape measures provide arm reach and leg reach distances. A head assembly includes a 180° compass and a retractable reference line to provide angle of vision measurements in elevation and azimuth. The device also includes hip, back and shoulder assemblies which can be adjusted to any percentile rank dimension specified or any population.

3,722,104

FALSE FINGERNAIL CLASSIFIER

Eugenio Enzetti, Calle Laguna No. 923, Buenos Aires, Argentina

Filed June 1, 1971, Ser. No. 148,629
Claims priority, application Argentina, Dec. 1, 1970, 232729
Int. Cl. G01b 3/04, 3/14, 5/20
U.S. Cl. 33—174 D 5 Claims



The present invention relates to a gauge for measuring and classifying a fingernail to which a false nail is to be applied.

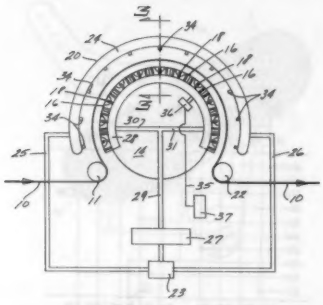
3,722,105

APPARATUS AND METHOD FOR APPLYING RADIO FREQUENCY ENERGY TO A MOVING WEB OF MATERIAL

William W. Marteny, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed July 6, 1971, Ser. No. 159,630
Int. Cl. B01k 5/00
U.S. Cl. 34—1 4 Claims

A moving web of material, preferably of newly formed paper, is diverted from its normal path of travel and directed through a radio frequency drying area and returned to the normal path of progress. Radio frequency electrodes are arranged around an arcuate path which the web of material follows, thereby minimizing the space required to incorporate radio frequency drying into an existing process. The electrode holders have passages formed therein which are connected to a source of heated air. Air is emitted through the electrode holders and acts to form an air film which prevents the web from touching the electrodes or electrode holders. An enclosure



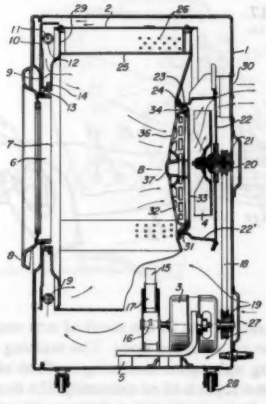
around the electrode holder area has a plurality of nozzles attached to its interior portion. The nozzles are connected to a source of heated air, the air emitted from the nozzles acting as a position control device for the web. The air emitted from the nozzles and the air film act in balance to maintain the web at a specified elevation above the electrodes. If the web should break, a pressure-sensitive element within the electrode enclosure senses a decrease in pressure and turns off the radio frequency power to avoid any danger to operating personnel.

3,722,106

CLOTHES DRIER

Kojiro Takeyama, Kawanishi, and Masao Hamamoto, Nishinomiya, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan

Filed Nov. 16, 1971, Ser. No. 199,123
Claims priority, application Japan, Nov. 25, 1970, 45/117384
Int. Cl. F26b 21/06
U.S. Cl. 34—82 2 Claims



A clothes drier which is so designed that a filter holding frame may be fitted to a rotary drum at its peripheral edge, whereby the mounting and demounting operations of said filter holding frame are simplified, the production cost of the drier is reduced and further the iint efficiency is enhanced.

3,722,107

CIRCUIT ARRANGEMENT FOR CODE CHECKING AND CODE TRANSFORMING

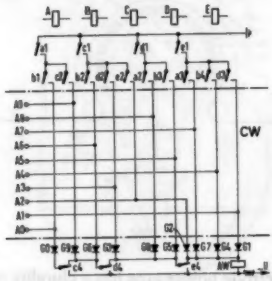
Edwin Muller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed March 5, 1971, Ser. No. 121,369

Claims priority, application Germany, March 10, 1970, P 20 11 310.4

Int. Cl. G06f 3/00

U.S. Cl. 340—347 DD **5 Claims**



A circuit is described for simultaneously performing code transformation and code checking operations, e.g. a "n" of "m" code may be transformed into a "1" of "z" code with simultaneous checking. The *z* outputs of a code transformer can be reached over *n* contacts of series - connected code relays. The contacts are activated in accordance with the "n" of "m" code combination stored in the relays. An error indicating relay, connectible to the *z* outputs, is present and has an activating circuit which is completed only when the proper code formation is present.

3,722,108

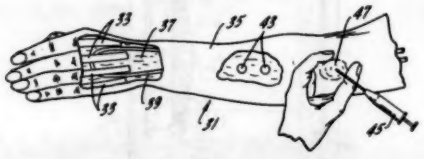
INJECTION TRAINING AID

Myron C. Chase, Red Wing, Minn., assignor to Weatherby/Nasco, Inc., Ft. Atkinson, Wis.

Continuation of Ser. No. 74,763, Sept. 23, 1970, abandoned. This application April 12, 1972, Ser. No. 243,352

Int. Cl. G09b 23/30

U.S. Cl. 35—17 **2 Claims**



A training aid for use in the medical arts and simulating at least a portion of a human body. The training aid includes a skin-simulating substance enclosing a flesh-simulating substance to form a replica of an extremity of a human body such as an arm. A bone-simulating substance is embedded in the flesh-simulating substance. Flexible tubes are embedded in the flesh-simulating substance to simulate arteries and veins. Fluid-receiving and retaining buttonlike members are placed immediately under the skin-simulating substance for use in teaching allergy testing.

3,722,109

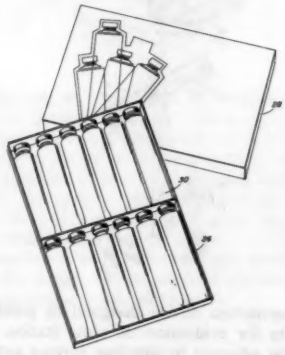
FINE AND GRAPHICS ARTS PRODUCTS FOR ENABLING AMATEURS AND OTHERS TO SELECT AND-UTILIZE COLOR MATERIALS WITH OPTICAL RESULTS OF INCREASED PREDICTABILITY

Nathaniel J. Jacobson, One Holden Street, Brookline, Mass.

Continuation-in-part of Ser. No. 78,644, Oct. 6, 1970, Pat. No. 3,628,260, which is a continuation of Ser. No. 694,736, Dec. 29, 1967, abandoned. This application Sept. 15, 1971, Ser. No. 180,701

Int. Cl. G09b 11/00

U.S. Cl. 35—28.5 **4 Claims**



A limited number of predetermined, systematically identified color materials are predeterminedly arranged in an array of distinguishable groups of colors of like "value," with reference to the terms "hue," "value" and "chroma" as used in the "Munsell Color System" (or with reference to equivalent terms as used in analogous systems). The user, in working with the array, efficaciously is enabled to create a particular color of predicted optical character by mixing given colors from a particular group of premixed colors of like "-value."

3,722,110

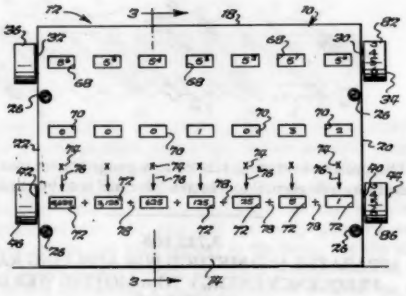
EDUCATIONAL TRAINING DEVICE

Mary F. Morrisey, and Thomas J. Morrisey, both of 3363 Baseline Road, Grand Island, N.Y.

Filed April 3, 1972, Ser. No. 240,453

Int. Cl. G09b 19/02

U.S. Cl. 35—30 **9 Claims**



A manually operable educational device for assisting the user in converting a numeral from one base numeration system to a corresponding numeral in a different base numeration system. The device comprises a frame for housing a plurality of rotatable cylinders having numerical indicia thereon selectively displayed through windows provided in the frame

front wall. Mathematical symbols are imprinted on the outer face of the front wall to correlate the displayed numerals in such a manner facilitating the computations thereof to effect the conversion of numerals from one to another base numeration system.

3,722,111

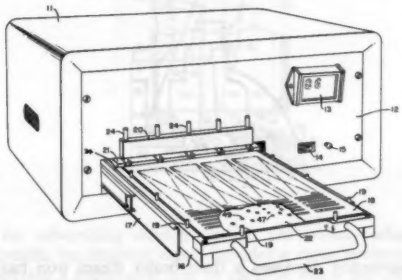
EXAMINATION PAPER TEST SCORE SYSTEM

Michael P. Georges, P.O. Box 800, Norwood, Mass.

Filed June 18, 1970, Ser. No. 47,264

Int. Cl. G09b *5/00*

U.S. Cl. 35—48 B **10 Claims**



The Examination Paper Test Score System provides for registry of a multiple column test answer sheet containing multiple-choice answer blocks with a light permeable predetermined pattern representing answer response positions. A test bed transports the registered master answer-aperture plate and test sheet past a scan line of photo detector devices which register the student's score as the number of light transmissive areas contained in each row and each row consisting of a plurality of blocks from adjacent columns is read by scanning at a sensor row as the aligned sheets pass thereacross. The apertures in the test sheet and the master answer-aperture plate are related to provide a constant transmission aperture area with a substantial misalignment tolerance.

3,722,112

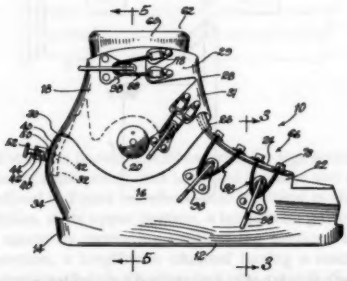
SKI BOOT CONSTRUCTION

Gerard E. Morgan, Lake Forest, Ill., assignor to Riddell, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 851,936, Aug. 21, 1969, Pat. No. 3,570,148. This application Feb. 18, 1971, Ser. No. 116,405

Int. Cl. A43b *00/00*

U.S. Cl. 36—2.5 AL **17 Claims**



A ski boot providing securing means for tightening the boot around the foot. The securing means includes a band having its ends secured to boot portions. The ends of the band are threadably attached so that infinite adjustments are possible to accommodate different wearers. The band preferably comprises a spring mounted around a wire or cable whereby a strong, flexible and threadable member is provided.

3,722,113

ARTICLE OF FOOTWEAR

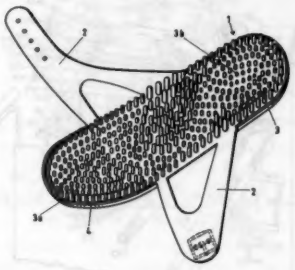
Karl Birkenstock, Lohfelder Str. 40-42, bad Honnef, Germany

Filed May 6, 1971, Ser. No. 140,691

Claims priority, application Germany, June 20, 1970, G 70 23 257.4

Int. Cl. A43b *3/12*

U.S. Cl. 36—11.5 **16 Claims**



An article of footwear has uppers which may in form of straps, and a sole of yieldable elastomeric material which is provided at least on its upper and, according to some embodiments, on its lower surface with projections which extend substantially normal to the general plane of the respective surface. The projections may be of different length.

3,722,114

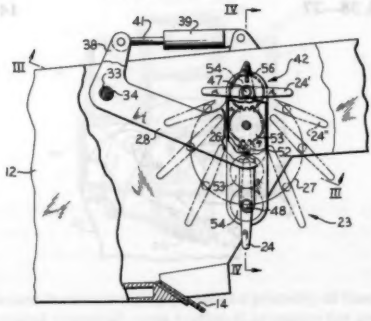
EPICYCLIC SELF-LOADING MECHANISM FOR A SCRAPER

Harvey A. Knell, Joliet; James A. Olthoff, South Holland; Barry A. Scoggin, Plainfield, and Roger M. Smith, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 1, 1970, Ser. No. 42,214

Int. Cl. E02f *3/04*

U.S. Cl. 37—4 **9 Claims**



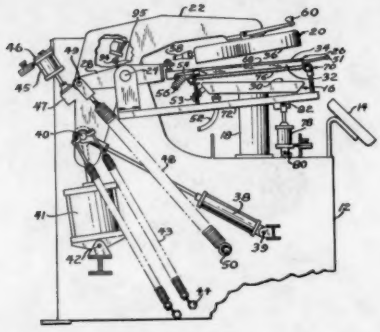
Movement of earth over the cutting edge of a scraper is assisted by a pair of blades which orbit about an axis of rotation which is parallel to the cutting edge and situated between the blades. Each blade also turns about an axis spaced from the orbit axis to provide a preferred inclination at each portion of the orbit. The blades are supported by the planetary gear carrier of an epicyclic gear set which drives the blades and which has a non-rotating sun gear at the orbit axis.

3,722,115

GARMENT PRESS

Richard M. Hanson, Salt Lake City, Utah, assignor to McGraw-Edison Company, Elgin, Ill.

Filed July 12, 1971, Ser. No. 161,657
Int. Cl. D06f 71/00
U.S. Cl. 38—21 11 Claims



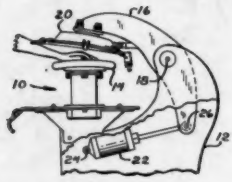
A garment press having at least a pair of opposing press heads and including a porous article supporting leaf between the cooperating press heads and means for spacing the leaf from the lower press head so that the article to be pressed can be easily dressed thereon and for moving the leaf against the lower press head during pressing of the article, and further having means for separating the press heads only slightly after the pressing cycle and for drawing vacuum in one of the heads for cooling and drying air flow over the article yet on the leaf.

3,722,116

GARMENT PRESS HEAD SAFETY CONTROL

Michael G. Beeley, Salt Lake City, and Richard D. Thompson, Granger, both of Utah, assignors to McGraw-Edison Company, Elgin, Ill.

Filed May 3, 1972, Ser. No. 250,067
Int. Cl. D06f 71/08
U.S. Cl. 38—27 14 Claims



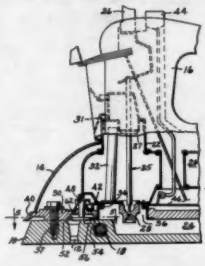
A safety control for a garment press having complementary heads which are moved between separated and closed positions, and specifically including a cable tautly suspended in surrounding proximity from one head at a location to hit and be laterally deflected by any part of an operator between the heads upon the heads closing, a pickup member connected to the cable and shifted when the cable is displaced laterally, and control components responsive to the shifted pickup member operable to shut off head closing power to the press and to dump all press power to allow quick head separation.

3,722,117

STEAM NOZZLE IRON

William E. Davidson, Ontario, Calif., assignor to General Electric Company, Bridgeport, Conn.

Filed May 15, 1972, Ser. No. 253,427
Int. Cl. D06f 75/06
U.S. Cl. 38—77.83 10 Claims



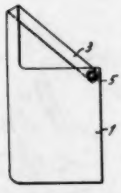
The invention discloses a flash boiler steam iron having separate primary and secondary steam chambers formed by the soleplate and coverplate of the iron and using steam valve means between the chambers wherein the valve means is selectively movable to control steam flow sequentially through the primary and secondary chambers in one position and solely through the primary chamber in another position. The iron has nozzle means thermally connected to the soleplate and directed forwardly and downwardly toward the fabric whereupon steam is controlled by the valve structure to pass through the soleplate or to discharge a curtain of visible steam ahead of and around the nose of the iron.

3,722,118

ATTACHABLE LABEL

Xaver Burgi, General Guisan Strasse 36, Aarau, Switzerland

Filed Dec. 31, 1970, Ser. No. 103,194
Claims priority, application Switzerland, March 20, 1970, 4304/70
Int. Cl. G09f 3/14
U.S. Cl. 40—21 R 2 Claims

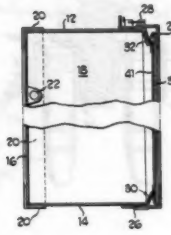


An attachable label characterized by a wider portion which serves to receive an inscription and which is provided with one part of a fastening means, and by a narrower portion which constitutes an elongated strip and which carries the other part of the fastening means, the whole arrangement being such that when the elongated strip is bent over one fastening part can be brought into operative connection with the other fastening part.

3,722,119
ADVERTISING DISPLAY DEVICE

Marvin W. Braun, 1738 78th Court, Elmwood Park, Ill.

Continuation-in-part of Ser. No. 888,761, Dec. 29, 1969, abandoned. This application Feb. 3, 1972, Ser. No. 223,235
Int. Cl. G09f 13/04
U.S. Cl. 40—132 D 2 Claims

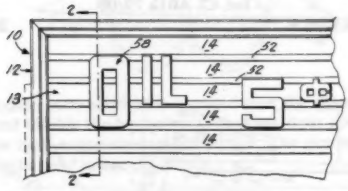


An advertising display device, particularly adapted for portable, backlighted signs, includes a clear, protective pane covering a translucent sign or card on which the copy is imprinted. The pane is provided with marginal flaps and sealing strips which envelope the edges of the sheet. When the assembled sign and pane are inserted in position in a hinged door frame panel, and the frame closed against a housing, the sealing strips are brought into sealing engagement with a flange extending from the housing to hold the sheet firmly in place, thus preventing entry of moisture and foreign matter.

3,722,120
DISPLAY SIGN

Henry Finkel, Westmount, Quebec, Canada, assignor to M. C. Webster Co. Ltd., Town of Mount Royal, Quebec, Canada

Filed Dec. 31, 1970, Ser. No. 103,119
Int. Cl. G09f 7/08
U.S. Cl. 40—140 9 Claims

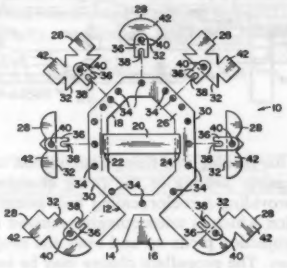


The disclosure herein describes a display sign which consists of a series of superposed slats identical in shape and supported and confined in frame members, also identical in shape; each slat includes, at its upper portion, a lengthwise groove defined by two upwardly extending resilient leg portions and, at its lower portion, a lengthwise channel having a restricted entrance portion slightly smaller than the overall distance extending between the extremities of the leg portions. Each slat further includes, on each of its front and rear faces, a longitudinally extending rail which cooperates with the rail of another slat to support indicia, such as letters, symbols and numerals. The disclosure also teaches two ways of mounting hooks on the back of these indicia in order to support them on the rails.

3,722,121
PICTURE FRAME

Edward Olczewski, 1650 7th Avenue North, St. Petersburg, Fla.

Filed Jan. 6, 1971, Ser. No. 104,312
Int. Cl. G09f 1/12
U.S. Cl. 40—152 8 Claims

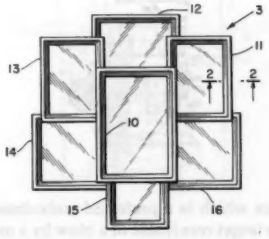


A picture frame comprising a body having a substantially annular configuration wherein a plurality of ornamental members may be removably attached to various points along the outer periphery of the body member. The members are attached by substantially U-shaped clips secured to each member and designed to cooperate with one of a plurality of screws adjustably attached to the body so as to connect the clip in locking engagement with the rear surface of the body. Each of the ornamental members may have a different configuration and may be interchangeably secured at various positions along the periphery of the body thereby allowing one to selectively change the ornamental configuration of the frame.

3,722,122
PICTURE FRAME ASSEMBLY

Louis J. Sesto, Redondo Beach, Calif., assignor to Photo Plastic International, Santa Monica, Calif.

Filed Nov. 22, 1971, Ser. No. 201,077
Int. Cl. G09f 1/12
U.S. Cl. 40—152 4 Claims



A picture frame assembly includes a plurality of frames having identical marginal cross-sectional contours for co-operation with clip means for securing the frames in overlapping relationship so that the assembled frames enable the creation of a collage of pictures mountable in the frames for hanging on a wall.

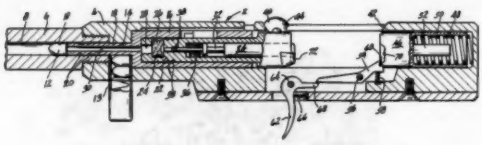
ERRATUM

For Class 40—152 see:
Patent No. 3,723,904

3,722,123
CASELESS AMMUNITION FIRING SYSTEM

Fred G. Parisi, Northford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 25, 1971, Ser. No. 174,706
Int. Cl. F41c *11/00*
U.S. Cl. 42—16 2 Claims

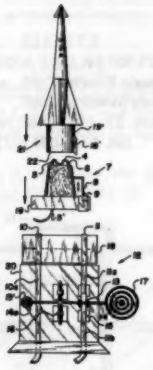


A system for feeding and firing ammunition of the variety having no casing. Sealing of the firing chamber is accomplished by providing a reciprocating bolt assembly having a bolt projection which is telescopingly received in the barrel bore. The projection picks up and seats the projectile in the firing chamber. The propellant charge may be secured to the projectile, or may be separately loaded in the bolt mechanism. In the latter case, a fluid passage extends from the propellant chamber through the bolt projection to the projectile chamber.

3,722,124
TARGET GAME

Albert Nathanson, 75-60 199th St., Flushing, N.Y.; Charles Girsky, 67 South Mall Dr., Melville, N.Y., and Matthew R. Miller, 77 South Bicycle Path, Selden, N.Y.

Continuation-in-part of Ser. No. 53,377, July 9, 1970, abandoned. This application Nov. 30, 1971, Ser. No. 203,203
Int. Cl. F41c *3/06*; A63b *63/00*, *71/06*
U.S. Cl. 42—54 12 Claims

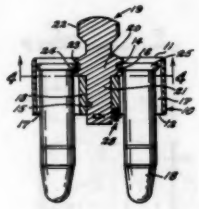


A toy device which in a preferred embodiment is a target game having a target receivable of a blow by a mallet, a dart, a BB, a bullet, or the like, a closing of the switch by a hitting of the target or a hitting of the bull's eye of the target serving to close a switch which is held in a closed position by a magnet, the closing of the circuit actuating an electrical circuit providing heat to an electrode in contact with an inserted cap which heat explodes the cap to cause a snugly fitting but removable enclosure to pop off because of the heat effect on the gases within the enclosure, the circuit being broken by a safety switch when the enclosure around the filament is popped off or other wise removed, the filament being of a removable and replaceable variety and mountable in a position such as to provide sufficient room for a cap to be inserted beneath the filament with the head of the cap in contact with a contact surface of the filament.

3,722,125
FAST LOADING CARTRIDGE HOLDER FOR REVOLVERS

Robert D. Switzer, 148 Sheridan Avenue, Fort Thomas, Ky.

Filed April 28, 1971, Ser. No. 138,263
Int. Cl. F42b *39/04*
U.S. Cl. 42—89 4 Claims

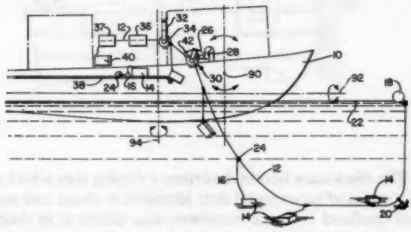


A holder for releasable securement of a round of cartridges in condition for simultaneous loading of the round into the cylinder of a revolver. The holder comprises a cylindrical body having a plurality of angularly spaced apart, cartridge receiving through-bores adapted to introduce the cartridge round into the chambers of a revolver cylinder. The holder also includes a manually operated cartridge engaging member mounted for oscillating movement on the holder body centrally of the through-bores and having a cartridge stop rim projecting laterally into common ends of the through-bores and a cam spaced from the rim and having laterally extended portions engageable under the case flanges of the cartridges and radially reduced portions between the extended portions that clear said flanges. The holder also includes an over-center spring detent means between the body and the cartridge engaging member to urge and then positively maintain the said member in either a cartridge round holding or a cartridge round discharging position.

3,722,126
MARINE HAULING APPARATUS

William D. Whipple, and Howard W. Gifford, Westport Point, Mass., assignors to Prelude Corporation, Westport Point, Mass.

Filed Nov. 2, 1970, Ser. No. 86,263
Int. Cl. A01k *79/00*
U.S. Cl. 43—6.5 20 Claims



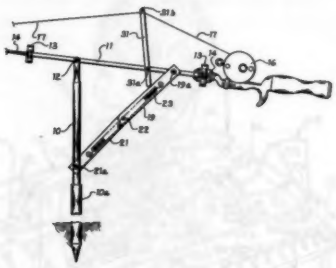
A marine surface vessel hauls a trawl of marine life-harvesting equipment with a first pulley-like unit located and movably jointed for lifting the trawl cable from the sea with minimal disturbance due to motion of the vessel relative to the sea and for separation of the trawl cable from the harvesting equipment attached to it, and with a second pulley-like unit located for positioning both the trawl cable and the harvesting equipment on the vessel for further handling.

3,722,127

HOOK-SETTING FISHING ROD HOLDER

Vern A. Atkins, Sr., 4118 N. Sheridan, Indianapolis, Ind.

Filed Nov. 16, 1970, Ser. No. 89,635
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 2 Claims



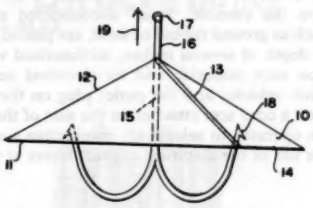
Disclosed is a member establishing the attitude of a fishing rod attached to it, the member being held in a substantially horizontal position by the over-center position of a toggle assembly. A trigger lever, actuated by a relatively light pull on the fishing line, nudges the toggle assembly back across center when the line is pulled to snap the member, and hence the tip of the fishing rod sharply upwardly. The mechanism is distinguished by the fact that triggering or release occurs without the necessity of exerting a force large enough to overcome that exerted by the over-center toggle spring.

3,722,128

SNAG SHIELD AND SCENT CARRIER FOR LURE HOOKS

Denis Tremblay, 526 Yale Avenue, E., Winnipeg, Manitoba, Canada

Filed Feb. 3, 1971, Ser. No. 112,309
Int. Cl. A01k *83/00*
U.S. Cl. 43—42.1 1 Claim



A flexible porous shield is engaged over the shank of a fish hook and shields the barbs from snags yet does not interfere with the barb engagement when struck. The porous material may also be used as a scent carrier.

3,722,129

FISHING LURE

Jay E. Jensen, 811 Lynwood Street, Raritan, N.J.

Filed Nov. 20, 1970, Ser. No. 91,385
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.03 4 Claims

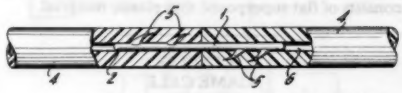
A fishing lure in which a transducer is carried by a body member and is responsive to information from the water in which the lure is placed for regulating the position of a pair of fins pivotally mounted to the body member, to control the depth of the fishing lure in the water.

3,722,130

ELEMENT FOR RAPID JOINT FOR TUBULAR FISHING LINES

Ernesto G. Handl, Paso de Los Andes 153, Mendosa, Argentina

Filed March 12, 1971, Ser. No. 123,710
Claims priority, application Argentina, March 12, 1970, 227495
Int. Cl. F16g *11/00, 11/08*
U.S. Cl. 43—44.98 5 Claims



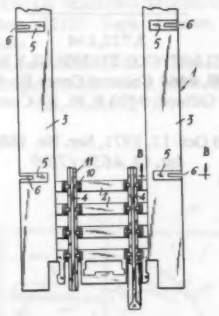
This is a rapid action connecting element for tubular fishing lines: This element can be used to repair cut lines and to assemble sections. The element comprises a single flexible pin with rounded ends with barbs at its ends having their point directed toward the central section of the pin. Half the pin is introduced into a hole in one tubular line and the other end of the pin is introduced into an end of another tubular line. Upon pushing the ends of the tubular lines together, they are held connected, by reason of the barbs becoming embedded in the lines.

3,722,131

BRIDGE FOR MINIATURE TRAINS

Alessandro Rossi, Como, Italy, assignor to Rivarossi S.p.A., Como, Italy

Filed Nov. 23, 1971, Ser. No. 201,344
Int. Cl. A63h *33/00*
U.S. Cl. 46—1 K 6 Claims



A bridge for miniature trains comprising at least a rail section having laterally coupling seats for removably engaging transverse extension of garder means.

3,722,132

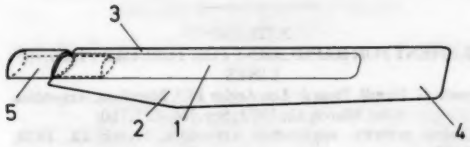
WING FOR TOY AIRPLANES, PARTICULARLY HELICOPTERS

Uwe C. Seefluth, 2409 Klingberg, Seestrasse, Klingberg, Germany

Filed Feb. 8, 1971, Ser. No. 113,496
Int. Cl. A63h *27/12*
U.S. Cl. 46—75 15 Claims

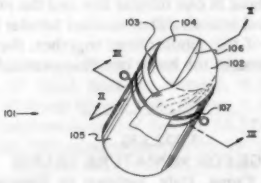
A toy airplane wing, particularly a rotary wing for toy helicopters, comprising an upper and a lower profiled

semimonocoque shell members of plastic material joined together to form the wing the profiling being such that only a



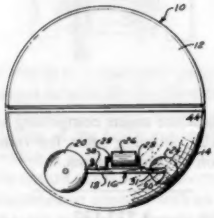
partly hollow body is formed while the greater part of the wing area consists of flat superposed thin plastic material.

3,722,133
GAME CALL
James K. Morgan, P.O. Box 688, Jackson, La.
Filed March 8, 1972, Ser. No. 232,709
Int. Cl. A63h *5/00*
U.S. Cl. 46—178 **6 Claims**



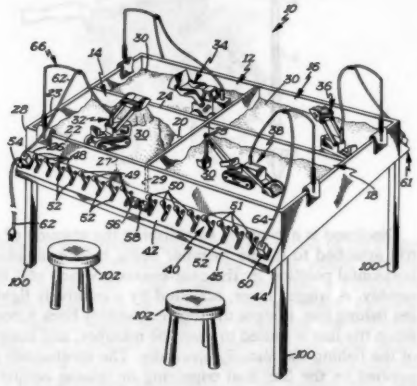
A call for imitating the sound of wild game having a resilient sound producing membrane in combination with two different sound controlling means.

3,722,134
SELF-PROPELLED CONTINUOUSLY MOVING TOY
Charles E. Merrill, 4461 Coconut Creek Blvd., Pompano, Fla., and Joseph H. Gifford, 9403 N.W. 37 Court, Coral Springs, Fla.
Filed Oct. 12, 1971, Ser. No. 188,322
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **9 Claims**



A self-propelled toy that moves about a planar surface, changing direction whenever an obstacle too large to drive over is contacted. The toy is comprised of a rigid, hollow shell having a driving means, within which the driving means provides the necessary torque on the shell for forward and turning motion.

3,722,135
PLAY TOY FOR USE WITH MINIATURIZED VEHICLES
Richard W. Jacobson, Route 1, Grand Meadow, Ill.
Filed Dec. 27, 1971, Ser. No. 212,076
Int. Cl. A63h *33/26*
U.S. Cl. 46—244 A **10 Claims**



A play toy for use with miniaturized, motorized electrically driven vehicles to allow the selective manipulation of such vehicles is disclosed. In the preferred embodiment, an open top, box-like container is arranged upon legs to approximately table top height. Arranged on the sides of the container are electrical power control consoles each including four electrical control levers for controlling the power to an outlet plug mounted on the console. Small unconnected particles of material such as ground rubber or sand, are placed in the container to a depth of several inches; miniaturized vehicles are placed upon such material; and an electrical control cord between such vehicles and the outlet plug on the console is supported on a cord arm attached to the side of the container to allow an operator to selectively manipulate such vehicles through the use of the electrical control levers at the control console.

3,722,136
HOUSEKEEPING DOLL HAVING REVERSIBLE MOTOR DRIVING SELECTIVELY MOVABLE ARMS
Herbert Thorn, Flushing, and Harvey Berkin, Merrick, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Oct. 27, 1971, Ser. No. 193,066
Int. Cl. A63h *29/22, 13/04*
U.S. Cl. 46—247 **30 Claims**

A toy doll is provided which has a reversible electric motor therein operatively connected to a gear train for separately and independently oscillating the arms of the doll, with one of the arms being mounted for oscillation about a horizontal axis and the other arm being mounted for oscillation about a vertical axis. Separate oscillation of the arms is accomplished by means of unidirectional clutches which permit movement of only one of the arms in accordance with the direction of rotation of the motor. In addition, the same reversible motor is operably connected to the doll's head and a mounting struc-

ture for the doll's legs so as to oscillate the doll's head about a vertical axis while simultaneously oscillating the doll's torso

about a fore-and-aft axis, to simulate human movement, irrespective of the direction of rotation of the motor.

3,722,137

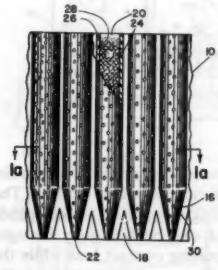
TRANSPLANT HANDLING MEANS

Donald A. Kesinger, Denver, and Leland S. Inscho, Jr., Broomfield, both of Colo., assignors to The Gales Rubber Company, Denver, Colo.

Filed Dec. 30, 1970, Ser. No. 102,582

Int. Cl. A01g 9/10; A01c 11/02

U.S. Cl. 47—34.13 **7 Claims**



Process and apparatus are described for handling and treating a plurality of seeds including the method of (1) forming a continuous transplant carrier provided with spaced containers, each of sufficient size to accommodate a germinated seed or plant, and media to support growth and provided with means for exchange of moisture and gases, (2) inserting seed and support media within the containers, and (3) germinating and preculturing the seeds in the containers for at least a period of time to allow radical and cotyledon to emerge from the seed coats and develop. The invention is particularly useful in the automated transplanting of a variety of plants including high value crops such as sugar beets and lettuce.

3,722,138

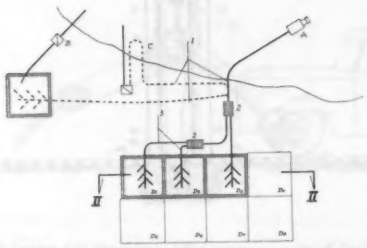
PROCEDURE FOR A DIRECTED HYDRAULIC FILL

Harnaj D. Veceslav, Bucharest, Romania, assignor to Institue De Petrol, Bucharest, Romania

Filed Nov. 3, 1970, Ser. No. 86,484

Int. Cl. B03b 1/00

U.S. Cl. 47—58 **8 Claims**



A slurry obtained from a hydraulic excavating or dredging process is passed through classifiers which grade its solid phase according to particle size. The area to be filled is subdivided into a plurality of basins and secondary slurries carrying the fractions are deposited successively in these basins. Simultaneous with the deposition of the coarse-fraction slurry in a second basin and after the settling of the coarse fraction in the first basin, a medium-fraction slurry is deposited in the first basin. Thereafter the coarse-fraction slurry is deposited in a third basin, the medium-fraction slurry in the second basin, and a fine-fraction slurry in the first basin, making a three-blanket-coarse, medium, and fine-layering in the first basin. Then all three slurries are simultaneously deposited and settled down the line in the other basins.

3,722,139

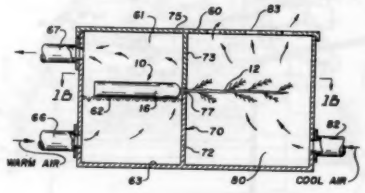
CONTAINERIZED TREE SEEDLING UNITS AND METHOD OF MAKING THESE UNITS

Norman R. Pelton, 12127 York Avenue, Haney, British Columbia, Canada

Continuation-in-part of Ser. No. 757,991, Sept. 6, 1968, abandoned. This application Nov. 5, 1970, Ser. No. 87,201

Int. Cl. A01g 9/10

U.S. Cl. 47—58 **7 Claims**

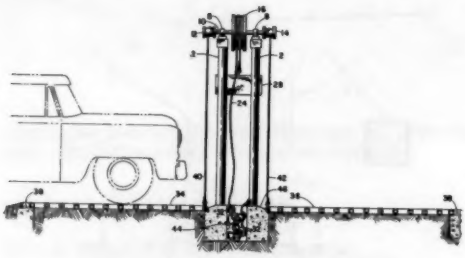


A containerized tree seedling unit including an elongated container around the roots of a tree seedling and made of a clay-like mud in and around the roots, and means for maintaining the container in a semi-rigid state for handling, storing and planting purposes. Peat moss and/or fertilizer may be included in the mud. A method of producing this containerized unit which includes pressing a body of moist clay-like material into and around the root system of the seedling to form the container.

3,722,140
AUTOMATIC GATE

John M. Newton, Rt. 3, Box 207, Grapevine, Tex.

Filed Feb. 17, 1971, Ser. No. 115,966
Int. Cl. E05f *13/04*
U.S. Cl. 49—30 17 Claims

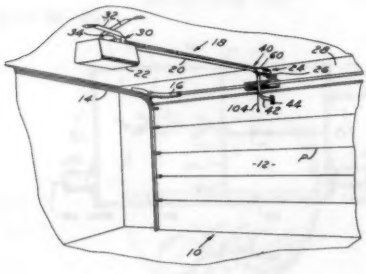


An automatic gate characterized by several distinctive features, including: (1) the use of flexibly mounted barrier members forming a collapsible gate that moves downwardly into a recess means to open the gate; and (2) timed hold down means to keep the barrier members lowered for a period of time after a vehicle has moved off an approach ramp that effects the lowering in order to allow passage of long trailers onto the ramp. Also disclosed are specific structures for carrying out the respective embodiments including: (1) the use of a counterweight in the raising means, (2) the use of five or more tubular barrier members for preventing exit of small livestock such as sheep and the like; (3) a cattle guard type approach treadle so that an animal cannot walk on the treadle to open the gate; and (4) an arming lever, and a cam for engaging a free end of the arming lever such that the timer is armed by downward movement of the approach treadle but allowing return of the arming lever and the treadle.

3,722,141
OVERHEAD DOOR OPERATOR RELEASE

Harold L. Miller, Detroit, Mich., assignor to Vemco Products, Inc., Detroit, Mich.

Filed May 28, 1971, Ser. No. 148,093
Int. Cl. E05f *11/54, 15/16*
U.S. Cl. 49—139 9 Claims

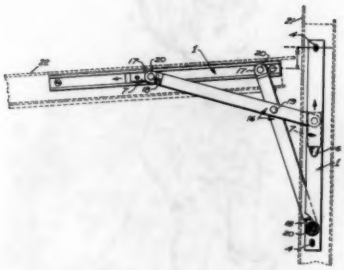


A traveler for an overhead garage door operator with a linear power shuttle, a guide track and an actuator arm for raising and lowering a door. The traveler is connected to the actuator arm and carried by the track for reciprocating movement thereon. A biased latch connects the traveler to the power shuttle to open and close the door in normal operation, releases the traveler from the shuttle to facilitate manual opening and closing of the door, and automatically re-connects the traveler with the shuttle.

3,722,142
MOUNTING BRACKET FOR OVERHEAD WINDOW

Axel W. Anderberg, Los Angeles, and George A. Taylor, LaCrescenta, both of Calif., assignors to A. W. Anderberg Manufacturing Co., Los Angeles, Calif.

Filed June 16, 1971, Ser. No. 153,517
Int. Cl. E05d *15/28*
U.S. Cl. 49—248 8 Claims

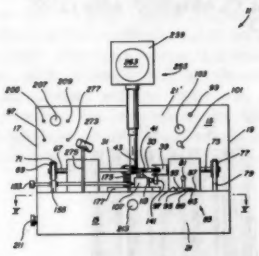


A mounting bracket for overhead windows wherein both the window frame and window have guide members. A pair of brace members are pivotally connected intermediate their ends to form four pivoting extremities, two of which are pivotally connected at a fixed axis to the two guide members, and two are pivotally connected to friction slides movable along the slide bars.

3,722,143
CONTACT LENS EDGE FINISHING MACHINE

Truman W. Cottom, Memphis, Tenn., assignor to Roy W. Mabry, Tutwiler, Miss.

Filed Jan. 29, 1971, Ser. No. 110,979
Int. Cl. B24b *13/00*
U.S. Cl. 51—5 1 Claim

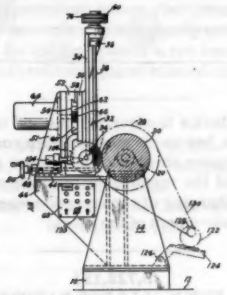


A portable machine used to accomplish the final operations in the sequence of fabricating a contact lens. The machine includes a pair of rotating inwardly directed spindles, each having a rubber tip and can be bindingly brought together to firmly support the rotating contact lens while the final operations are effected. A feature of the machine is the lens centering device which accurately positions the geometrical center of the lens in coincident alignment with the rotating axes of the spindles. The machine also includes a movable guidably supported cutting tool for concentrically reducing the diameter and the thickness of the lens at the periphery thereof, a movable guidably supported rotating polishing wheel for blending the newly cut surfaces with the previously ground optic surfaces and polishing the periphery of the lens, a unique mechanical oscillator which cyclically shifts the rotating axis of the polishing wheel so as to automatically and uniformly polish all the newly cut surfaces, i.e., the terminal edge, the convex surface and the concave surface of the lens, and a workpiece enlarger which presents a visual blow-up of: the lens, the cutting tool, and the polishing wheel to the operator.

3,722,144
METHOD AND MACHINE TO DE-BUR COMMUTATOR BARS

Cyril J. Rickrode, New Oxford, and Charles A. Becker, Hanover, both of Pa., assignors to Cam Industries, Inc., Hanover, Pa.

Filed April 6, 1971, Ser. No. 131,642
Int. Cl. B24b *1/00, 5/04*; B24d *13/02*
U.S. Cl. 51—50 R 14 Claims

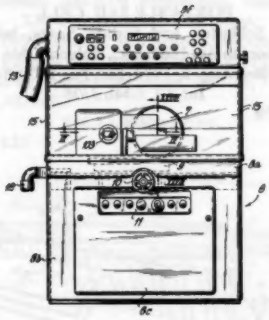


This invention comprises a method and one embodiment of a machine for automatically deburring the opposite sharp edges of commutator bars of the armatures of electric motors and generators by the use of an abrading brush rotatably driven in opposition to the direction of rotation of the commutator while the brush traverses the bars thereof longitudinally. At the completion of deburring one similar edge of each bar, the rotary directions of the brush and commutator are reversed to deburr the opposite edges of the bars.

3,722,145
MACHINE FOR GRINDING OF WORKPIECES

Heinz G. Amrhein, Buderich; Herman Stander, Dusseldorf, and Heinz Rosenow, Osterath, all of Germany

Filed May 12, 1970, Ser. No. 36,582
Claims priority, application Germany, May 13, 1969, P 19 24 315.3
Int. Cl. B24b *7/00, 5/00*
U.S. Cl. 51—56 41 Claims

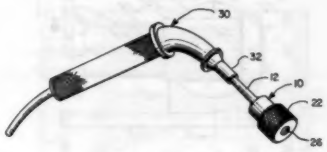


Batches of identical turnplates or analogous metallic workpieces are ground in an automatic machine wherein a pusher evacuates workpieces from a magazine and delivers them into the receptacle of a transfer unit which changes the orientation of such workpieces and places them between two pins of a clamping unit. The latter is mounted on a carriage which is reciprocable along a supporting table and moves the workpieces against the active surface of a cupped grinding wheel.

3,722,146
DEVICE FOR SHARPENING THE TAPERED POINTS OF DENTAL INSTRUMENTS

Leopoldo Rodriguez, 1304 Academy Boulevard, Colorado Springs, Colo., and Donald G. Birk, 1130 Waston Road, Colorado Springs, Colo.

Filed March 2, 1971, Ser. No. 120,176
Int. Cl. B24b *3/60, 23/00*
U.S. Cl. 51—73 R 6 Claims

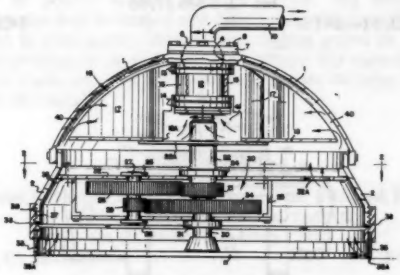


A novel device for sharpening the tapered ends of dental instruments such as explorers and picks is disclosed. The device comprises an elongated housing having a shaft extending from one end thereof for insertion into a dental drill which effects rotation of the housing about an axis. The other end of the housing defines an open, elongated cavity in axial alignment with the shaft. A grinding stone is adapted to be removably inserted into the cavity, the stone having a cylindrical bore therethrough in alignment with the rotational axis of the housing and being maintained in place in the housing by a removable end cap. The tapered ends or points of dental instruments are inserted into the cylindrical bore of the stone while the housing is being rotated by the dental drill and, through suitable manipulation of the dental instrument, the tapered point thereof can be readily renewed.

3,722,147
AIR DRIVEN ABRADING DEVICE

Lawrence M. Brenner, 1500 Golden Avenue, Eugene, Oreg.

Filed Aug. 16, 1971, Ser. No. 171,860
Int. Cl. B24b *25/00, 55/06*
U.S. Cl. 51—170 T 7 Claims



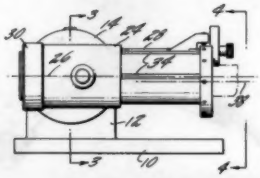
An air powered device for abrading wall and floor surfaces. A turbine is disclosed within a dome-like housing. An abrading disc is powered by the turbine via a gear reduction drive. A source of reduced air pressure draws air into the housing past the periphery of the disc for the pick up of dust particles with the airflow path being inwardly to an area of low pressure located centrally of the turbine. A conduit member in communication with said source is movably attached to the dome-like housing and may additionally serve as a hand hold. An air barrier restricts the incoming airflow to the path over the periphery of the abrading disc.

3,722,148

UNIVERSAL TOOL SHARPENING FIXTURE

Arne Y. Grahn, Granby, Conn., assignor to The Poly-Choke Company, Incorporated, East Hartford, Conn.

Continuation-in-part of Ser. No. 722,952, April 22, 1968, abandoned. This application April 23, 1970, Ser. No. 31,232
Int. Cl. B24b *3/18*
U.S. Cl. 51—225 17 Claims



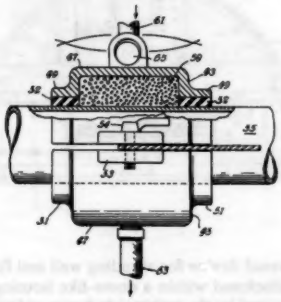
In the present invention of a universal tool sharpening fixture, a pair of sleeves are provided, one being rotatably mounted and the other being eccentrically positioned within the rotatably mounted sleeve so that an eccentric path of motion can be generated. A tool holder is positioned in the eccentrically mounted sleeve, and the periphery of the tool holder has a series of depressions which cooperate with a plunger to define successive positioning stations for the flutes of the tap to be sharpened. In one embodiment a positioning blade is mounted on the holder to insure a proper initial location of a tool in the holder and a two-step mechanism controls the degree of rotation of the rotatable sleeve depending on the requirements of a tool to be sharpened. In another embodiment rotational adjustment of the detent mechanism permits the radial relief at the cutting edge of the tool to be varied for either right- or left-hand tools.

3,722,149

GRIT PAD CLEANER

Albert G. Bodine, 3877 Woodley Avenue, Van Nuys, Calif.

Continuation-in-part of Ser. No. 759,034, Sept. 11, 1968, abandoned, which is a continuation-in-part of Ser. No. 699,198, Jan. 19, 1968, Pat. No. 3,544,292, which is a continuation-in-part of Ser. No. 423,559, Jan. 5, 1965, Pat. No. 3,380,195. This application April 12, 1971, Ser. No. 133,068
Int. Cl. B24b *31/06*
U.S. Cl. 51—241 S 4 Claims



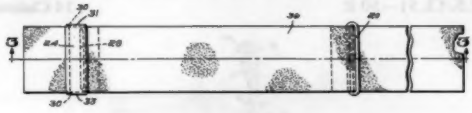
A device for cleaning surfaces and the like which is comprised of a plate subjected to resonant sonic vibration and a high-impedance material, such as rubber, connected to and extending from the vibratory surface to contact the surface to be cleaned, forming an enclosure when so in contact, the enclosure being filled with a cleaning grit material which is caused to vibrate by the vibratory plate.

3,722,150

ABRADING DEVICE TO CLEAN SURFACES

Arthur D. Pass, 27 Hazelwood St., Malden, Mass.

Filed June 30, 1971, Ser. No. 158,450
Int. Cl. B24d *15/04*
U.S. Cl. 51—391 7 Claims



An abrading device to clean fittings and such, particularly exterior surfaces, has an abrasive sheet in combination with a backer. The abrasive sheet and backer are retained by connective that hold the member in predetermined position of use, yet permit changing of such position whenever desired by a simple sliding movement of the sheet.

3,722,151

BACK AND END WALLS FOR BATHTUB ALCOVE

Stewart F. Gardner, c/o Central Storage and Ware Housing, Inc., 108 North Elkhart Avenue, Elkhart, Ind.

Filed March 8, 1971, Ser. No. 121,943
Int. Cl. A47k *3/08*
U.S. Cl. 52—36 4 Claims

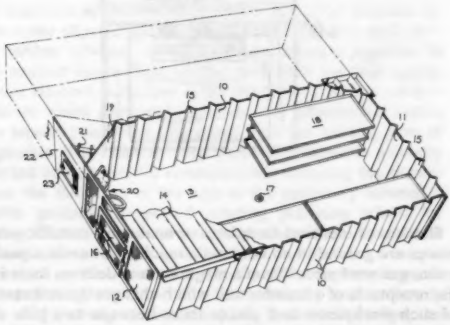
This invention relates to bathtubs, and particularly to finishing the installation of a tub in a rectangular alcove by means of a back and end walls quickly secured in position above the tub and having molded in designs for utility or appearance, and wherein the back and end walls are molded as a single relatively thin sheet, and after molding are adapted to be bent along vertical score lines to define the back and end walls and to allow for installation.

3,722,152

PORTABLE JAIL CELL

Benjamin G. Schlatter, and Sydney Spate, both of Toledo, Ohio, assignors to Art Inon, Inc., Toledo, Ohio

Filed Aug. 2, 1971, Ser. No. 167,984
Int. Cl. E04h *3/08*
U.S. Cl. 52—79 1 Claim



A portable jail cell which can be transported as a unit and installed in a jail or designated building. A windowless struc-

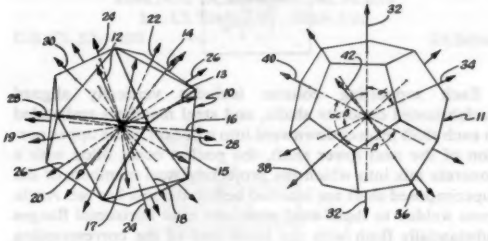
ture which has a foraminous metal screen door for light and air, is of ribbed sheet metal panels except for the floor. The floor is of cast concrete provided with channels on which to set and weld a unit cell. Sheet metal bunks which are welded inside the cell create a solid one piece unit. At one corner is an angled wall portion connecting contiguous side walls, and on the inner side of which are the toilet and wash bowl and on the outer side are suitable plumbing fixtures. This enables two cells to be placed side by side with adjacent angled wall portions to provide convenient access chambers and dispose the plumbing for the two cells in conveniently accessible location. The sheet metal for the wall panels is not less than one-eighth inch in thickness to militate against manual cutting.

3,722,153

STRUCTURAL SYSTEM

Stephen C. Baer, Corrales, N. Mex., assignor to Zomeworks Corporation, Albuquerque, N. Mex.

Filed May 4, 1970, Ser. No. 34,163
Int. Cl. E04b *1/32*
U.S. Cl. 52—81 **10 Claims**



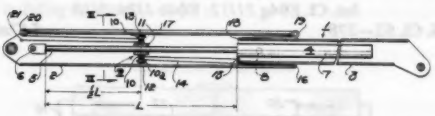
A structural system in which the structural members are interconnected so that they are parallel to the lines of the star of the faces of an icosahedron. The system includes structural members parallel to the lines of the star of the vertices of an icosahedron and also includes structural members parallel to the lines of the star of the midpoints of the edges of an icosahedron.

3,722,154

EXTENSIBLE BOOM WITH BUCKLING-PREVENTION

Teruya Sakamoto, 2482-10 Midori-cho, Sakaide; Takemi Nishimura, 230-14 Nonowe, Havikino, and Osamu Takarada, 1475 Omachi, Mure-cho, Kita-Gun, all of Japan

Filed Oct. 15, 1970, Ser. No. 80,913
Claims priority, application Japan, Jan. 31, 1970, 45/8718; Feb. 2, 1970, 45/9452
Int. Cl. E04h *12/34*
U.S. Cl. 52—121 **11 Claims**



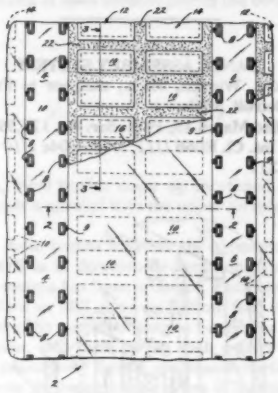
In an extensible boom of the type having telescopically extensible boom members, a buckling-preventing method for hydraulic cylinder unit employed in the boom wherein an intermediate position of an optionally extended piston-rod of said cylinder unit is always supported with a buckling-preventing device having legs slidably or rotatably engaged with inner circumference of a boom member. The present invention further includes driving means for said buckling-preventing device which moves the device to said intermediate position of the piston-rod in connection with the operation of said cylinder unit.

3,722,155

CEMETERY COVERED BY AN ARTIFICIAL TURF MATERIAL

Milton J. Glock, and Loran P. Glock, both of Belleville, Ill., assignors to said Milton J. Glock, by said Loran P. Glock

Filed Nov. 9, 1970, Ser. No. 87,982
Int. Cl. E04h *13/00*
U.S. Cl. 52—133 **10 Claims**



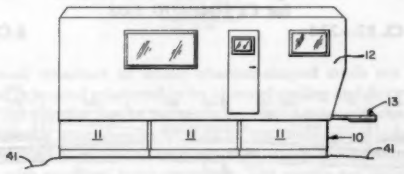
A cemetery has parallel pathways and one or two rows of crypts between each pair of pathways. Adjacent crypts in each row are positioned side-by-side, and either end of the crypts in each row are located at the pathway which extends along that row so that the crypts extend inwardly from the pathways. The tops of the crypts are substantially at pathway level and are covered by an artificial turf material or some other covering. Memorial markers may be set into the pathways opposite or at the ends of the crypts. Enough empty crypts to fill a substantial area or section between two or more pathways are set together, and this is usually achieved by cutting a trench or otherwise creating a depression large enough to accommodate the rows of crypts between the pathways. The entire depression may be formed and the pathways built between the rows of crypts. Then the trench or depression is provided with a base, and crypts are set upon that base. A gravel filler material may be poured between adjacent crypts. The trench or depression may be formed with large earth moving equipment which is considerably cheaper than digging graves on an individual basis. Prior to burial, the artificial turf material and top of a selected crypt are removed to expose the crypt interior for the burial.

3,722,156

MOBILE HOME SKIRTING

Charles E. Bryant, 15301-54 Highway West, Goddard, Kans.

Filed Aug. 21, 1968, Ser. No. 754,332
Int. Cl. E02d *5/74*; **E04h** *17/00*
U.S. Cl. 52—169 **8 Claims**



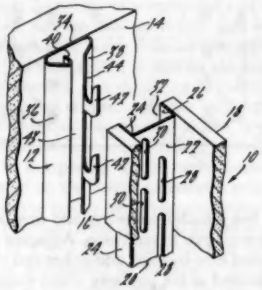
This invention comprises novel mobile home skirting that is economically manufactured, quickly installed, easily

removed, and conveniently stored. This invention resides in a system of skirting made of basically identical panel sections. Each panel section has a lower panel removably connected to an upper panel. Each upper panel is adapted to be connected or fixed to the underside of a mobile home. The lower panel can be lowered into contact with the ground and fastened. Each panel section is provided with means for aligning it with the next panel section. Also a utility panel and access panel is provided. The panels are best made available in lengths of 4 feet and 6 feet for fitting all sizes of mobile homes.

3,722,157
PANEL ASSEMBLY SYSTEM

Bohdan Prokop, Warren, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed March 15, 1971, Ser. No. 123,998
Int. Cl. E06b *1/12, 5/06;* **E04c** *1/10*
U.S. Cl. 52—211 **13 Claims**

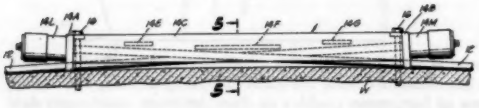


This disclosure pertains to a system for assembling prefabricated wall panel units for use in the construction of homes, buildings and other structures of a permanent or mobile nature. The panel assembly system is comprised of a panel receiving bracket, disposed along one vertical edge of a panel, which includes a plurality of vertically spaced, outwardly extending hook shaped projections, and a channel column, disposed along an adjacent edge of a second panel, having a plurality of vertically spaced slots disposed therethrough its web. The bracket and the hook shaped projections are adapted to be received therein a groove, defined by the inward surfaces of the channel, and the vertically spaced slots respectively, with interlocking being accomplished by relative vertical sliding movement therewith. Various embodiments of the above system are disclosed which include an interlocked connection with a door frame and an attachment method to a wall surface wherefrom the partition is to be extended.

3,722,158
PROTECTIVE ARRANGEMENT FOR EXPOSED TENSIONED CABLE

Maximiliaan Jacobus Dykmans, 4434 Mayapan Drive, La Mesa, Calif.

Filed Sept. 30, 1971, Ser. No. 185,132
Int. Cl. E04c *3/10, 5/08*
U.S. Cl. 52—224 **6 Claims**

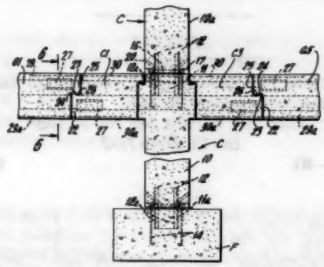


A protective covering is provided for a tensioned cable encircling a concrete tank. The covering is in the form of a tube having its opposite ends in a frame mounted on the tank. After the cable is prestressed, grout is poured into one end of the tube to fill the annular space between the cable and tube for protection of the stressed cable against corrosion and vandalism.

3,722,159
PREFABRICATED CONCRETE STRUCTURE

Samuel J. Kessler, 2500 Johnson Ave., Riverdale, N.Y.

Filed Oct. 27, 1971, Ser. No. 193,083
Int. Cl. E04b *1/30, 1/54*
U.S. Cl. 52—252 **9 Claims**

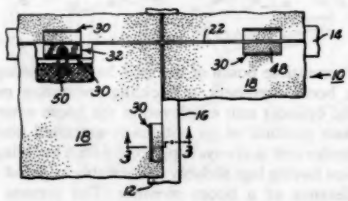


Each supporting column includes vertically aligned prefabricated concrete shafts, and steel members embedded in each shaft project downward into a pocket in the upper portion of the next lower shaft, the pocket being filled with a concrete mix into which the projecting steel members of the superimposed shaft are inserted before the mix has set. Angle irons welded to these steel members have horizontal flanges substantially flush with the lower end of the corresponding column shaft, and the flanges are secured to the upper ends of anchor rods embedded in the underlying shaft outside its said pocket. Integral with each column shaft are four horizontal brackets extending at a common level with an angle of 90° between each pair of adjacent brackets, and a prefabricated concrete girder extends horizontally from each bracket of each column to an opposing bracket of a remote column, each end portion of the girder resting upon and being interlocked with a shelf on the adjacent bracket. The opposite sides of the girders and brackets have ledges on which rest the adjacent marginal portions of prefabricated concrete floor slabs, these marginal portions interlocking with the ledges. Special means are provided for centering, leveling and aligning the interlocking parts.

3,722,160
DECK STRUCTURE AND CONNECTOR FOR DEMOUNTABLE PARKING BUILDING, OR THE LIKE

Charles A. Bentley, 443 North McCadden Pl., Los Angeles, Calif.

Filed Feb. 25, 1971, Ser. No. 118,613
Int. Cl. E04g *21/12;* **E04b** *1/24, 5/10*
U.S. Cl. 52—278 **5 Claims**



A deck structure for a demountable parking building, or the like, comprising beams providing rectangular bays, rectangu-

lar concrete slabs respectively covering the bays and having their edges seated on corresponding beams, connectors spaced apart along the edges of the slabs and securing them to the corresponding beams, and fittings spaced inwardly from the edges of the slabs for lifting them into and out of position.

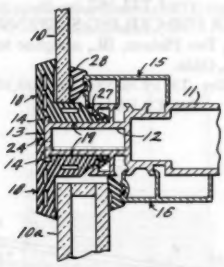
Each connector includes an angle member having a horizontal flange adjacent the bottom of the corresponding slab and having a vertical flange embedded in the corresponding slab and spaced inwardly from the corresponding edge thereof, a vertical bushing extending upwardly from the horizontal flange adjacent the vertical flange and embedded in the corresponding slab and welded to the angle member, a bolt extending through the bushing and the corresponding beam and having a nut threaded thereon, and a U-shaped anchor embracing the bushing and extending through and welded to the vertical flange of the angle member and having its free ends enlarged and embedded in the concrete of the corresponding slab.

3,722,161

CURTAIN WALL WINDOW GASKET CONSTRUCTION

Howard R. Brown, Bowling Green, Ohio, assignor to The D.S. Brown Company, North Baltimore, Ohio

Filed Nov. 19, 1970, Ser. No. 91,035
Int. Cl. E04b *1/62*; E06b *3/62*
U.S. Cl. 52—400 **2 Claims**



A glazing gasket construction for a curtain wall installation which secures the glass in place within a rigid structural form and thermally separates all structural members from outside air. The resilient gasket has a configuration, in cross section, which includes a sealing strip with a planar outer face having one edge extending over the adjacent window pane and the second edge over the structural support of the building. Extending inwardly from the sealing strip intermediate its edges is an attachment leg which is secured to the structural member. When side-by-side windows are installed, the gaskets are placed adjacent each other with their second edges in close abutment to cover any exposed structural member and to thus provide a thermal barrier between the outside air and the building structure.

3,722,162

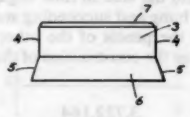
TESSELATION OR PAVING ELEMENT

Hans Thorkil Ludvigsen, Fjellebro, Rudme, Denmark

Filed Oct. 12, 1970, Ser. No. 79,887
Claims priority, application Germany, Oct. 13, 1969, G 69 39 758.6
Int. Cl. E04b *2/00*, *1/24*; E01c *5/00*
U.S. Cl. 52—608 **3 Claims**

Tesselation or paving element or tile comprising an underpart having two by two symmetrical side surfaces, of which one pair is converging and the other diverging in the direction of the upper surface, said part carrying at its upper surface a prism, the base of which is congruent with the upper surface, wherein said prismatic part makes up at least one-third, preferably more than half of the height of the element in order to improve the mutual interlocking in directions perpendicular to the surface of the paving as well as making the joints impenetrable for loose underlayer.

Tesselation of paving element or tile having parallel upper surfaces and bottom faces and oblique, two by two symmetrical side surfaces, of which at least one pair is converging in the upper surface and at least another pair in the bottom face, are



known. Thus, these bodies make up shortened cross prisms, the axis of which is parallel with the upper surface and the bottom face.

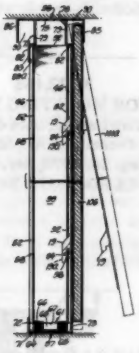
By joining these bodies together the elements are fixed in upwards as well as in downwards direction, when the tesselated or tiled pattern has been arranged. Each element may on its upper surface as well as on its bottom face carry a prism, the base of which is corresponding to or smaller than the surface in question, said base having such a form that the elements when joined may form a continuous surface. By these known elements the height of the prism in question is small in comparison with that of the cross prism.

3,722,163

APPARATUS FOR CONSTRUCTING REMOVABLE PARTITION WALLS

David M. Satkin, Hidden Hills; Gene B. Helvie, Newport Beach, and Charles J. Tillotson, Sepulveda, all of Calif., assignors to Architectural Partitions, Los Angeles, Calif.

Division of Ser. No. 846,379, July 31, 1969, Pat. No. 3,608,266. This application Nov. 23, 1970, Ser. No. 91,793
Int. Cl. E04b *2/78*, *2/82*
U.S. Cl. 52—122 **4 Claims**



A wall structure in which channel-shaped studs are supported in spaced relationship by channel ceiling and floor runners, the parallel legs of the studs providing side surfaces having laterally spaced pairs of slots at longitudinally spaced intervals, wall forming panels being removably mounted on the studs with marginal hook members. The panels are delivered to the construction site with the hook members coplanar with the inner surface of the panels. The hooks are then bent at the site into inwardly projecting position to extend into one longitudinal set of the slots of the slot pairs on the studs, the hook

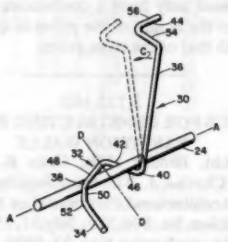
members of the other adjacent wall panel being arranged to extend into the other set of the slots of the slot pairs. The studs rest upon floor wedges which lock the studs into registry with a ceiling runner which thus becomes the reference point for vertical alignment of the wall panels. The wall structure is assembled by wedging a first stud in vertical alignment in registry with the ceiling runner, hanging a first wall panel from the stud, placing a second stud askew between wall and ceiling runners and rotating or twisting the stud into final position by engaging the unattached marginal hooks of the first panel in the slots of the stud and then lifting the stud against the ceiling runner and wedging the stud in that reference position, which relates the hooks and the stud in final engagement. Succeeding wall panels are hung and succeeding studs put in place in like manner, while the panels of the other wall face are attached during or after the construction of the first wall face.

3,722,164

SPRING WIRE SPACER, ESPECIALLY FOR SPACING REENFORCING MESH FROM THE FORM IN THE MANUFACTURE OF CONCRETE STRUCTURES AND THE LIKE

Hartzell H. Schmidgall, c/o Hawkeye Concrete Products, Mediapolis, Iowa

Filed Feb. 9, 1971, Ser. No. 113,976
Int. Cl. E04c *5/16;* **E04h** *12/00*
U.S. Cl. 52—684 **5 Claims**



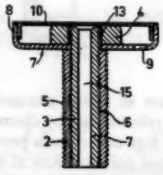
In the casting of concrete pipe, etc. the reenforcing mesh must be kept in spaced relation to the form during the introduction of the concrete. This invention pertains to a novel spring wire spacer attachable to and detachable from the mesh and having a projection engageable with the form to space the mesh properly.

3,722,165

DEVICE FOR MOUNTING WALL PARTS

Erik Forsberg, and Uno Landin, both of Vallingby, Sweden, assignors to Gunnar Fredrikson AB, Stockholm, Sweden

Filed Aug. 24, 1970, Ser. No. 66,380
Int. Cl. E04b *1/38;* **E04c** *5/00*
U.S. Cl. 52—704 **4 Claims**



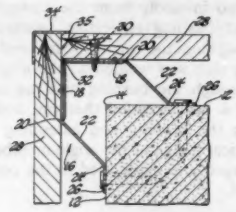
A device for securing building parts such as a base plate to a concrete foundation wherein a nut is threadedly engaged with a rod having a cutting edge, the rod being disposed in a tube anchored in the foundation, whereby the rod can be screwed into the material of the base plate by turning the nut.

3,722,166

CORNER FURRING STRIP

Frank J, McNerney, 7381 Muerdale Boulevard, Walled Lake, Mich.

Filed March 12, 1971, Ser. No. 123,519
Int. Cl. E04b *2/60*
U.S. Cl. 52—720 **4 Claims**



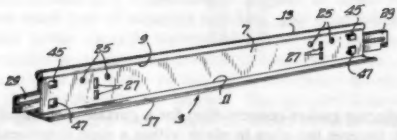
An elongated unitary strip member which supports wall panels at a corner intersection of a building. The strip member has a cross section including a pair of faces upon which the panels are supported and which are spaced from the corner defined by the building walls. A leg extends from the outward end of each face at an angle of approximately 135° relative to the face and a flange extends parallel to each leg from the end thereof. The flanges are secured to the walls of the building.

3,722,167

RUNNER FOR CEILING SUSPENSION

Donald L. Rousey, Des Plaines, Ill., assignor to Questor Corporation, Toledo, Ohio

Filed Dec. 23, 1970, Ser. No. 100,908
Int. Cl. E04c *5/55*
U.S. Cl. 52—726 **6 Claims**



A main runner for a suspended ceiling construction comprises a member of generally inverted T-shape and having opposed tongues for engagement with a channel-shaped guide structure of adjacent runners. Each tongue has a locking tab at its lower side that snap fits with the guide structure at a region offset from the line of flexing of the guide structure. The lower corner of the tongue adjacent to the locking tab is cut away to provide clearance for the tongue of the endmost runner to permit that runner to be tilted during its assembly with the first mentioned runner.

3,722,168

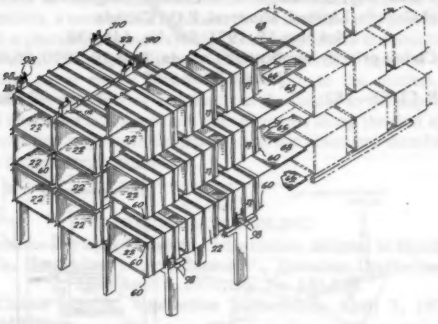
METHOD OF MODULAR BUILDING CONSTRUCTION

Daniel Comm, Highland Park, Ill., assignor to Dano Modules, Inc, Chicago, Ill.

Division of Ser. No. 705,391, Feb. 14, 1968, Pat. No. 3,514,910. This application June 1, 1970, Ser. No. 42,340
Int. Cl. E04b *1/00;* **E04g** *21/00*
U.S. Cl. 52—742 **10 Claims**

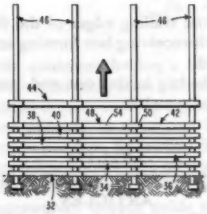
A method of constructing a building from a number of prefabricated modules. Each of the modules has solid spacing ribs on its outer surface, which ribs cooperate with similar ribs on adjacent modules to define a series of spaces between adjacent modules. The modules are stacked and arranged ac-

cording to a predetermined building plan, and selected spaces defined by adjacent sets of cooperating spacing ribs are filled



with poured concrete to form support columns for the building. A prefabricated module made especially for use with the method is also disclosed.

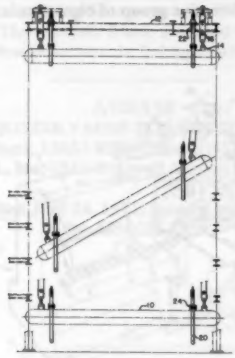
3,722,169
METHOD OF BUILDING CONSTRUCTION
Robert L. Boehmig, 3030 Peachtree Rd., Atlanta, Ga.
Continuation-in-part of Ser. No. 829,541, June 2, 1969, abandoned. This application Jan. 4, 1971, Ser. No. 103,665
Int. Cl. E04b *1/35*
U.S. Cl. 52—745 **2 Claims**



A method for construction of a multi-story building wherein the roof may be constructed first at an intermediate level, following which each floor is constructed in an elevation near ground level. After the floors are constructed, the roof and each floor is lifted to its ultimate elevation. The floors are constructed, one at a time, at closely vertically spaced intervals, and each is supported solely by the support columns during the construction. Thus, each floor serves as access to the construction of the next floor above but does not support the same. A constructional joint is provided to permit vertical movements of the floors relative to the columns after the floors are constructed. The joint basically comprises a collar arrangement disposed for receiving a vertical support column therethrough and the collar is shiftable vertically relative to the column. Further, the collar is constructed as an integral part of a horizontal beam extending outwardly from the column.

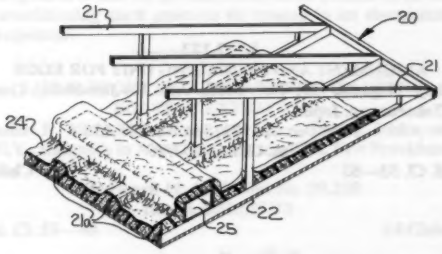
3,722,170
METHOD OF HOISTING AND ANCHORING HEAVY STRUCTURES IN A BUILDING
Herbert Francis Jones, West Haverstraw, N.Y., assignor to Treadwell Corporation
Filed Jan. 13, 1971, Ser. No. 106,219
Int. Cl. E04g *21/00*
U.S. Cl. 52—745 **4 Claims**

Method and apparatus for hoisting heavy elements is provided in which the supports for the element are hoisted along with the element itself. One or more beam assemblies are mounted on each of the supports above the element to be hoisted. Means for positioning each support with respect to



the element are also provided so that the element and supports may be hoisted into place with concurrent alignment of the supports with respect to openings provided for the permanent mounting of the element.

3,722,171
BUILDING ROOF STRUCTURE AND METHOD
Fred Darroll Godley, Charlotte, N.C., assignor to Modular Wall Systems, Inc., Charlotte, N.C.
Filed Oct. 6, 1971, Ser. No. 186,836
Int. Cl. E04b *1/00;* **E04g** *21/00;* **E04b** *7/02*
U.S. Cl. 52—745 **7 Claims**

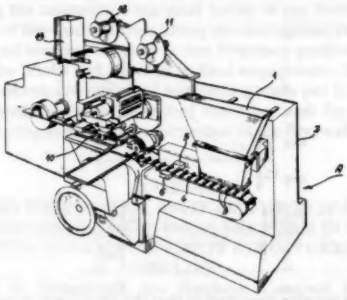


A building roof structure including adhered together panels defining a finished interior ceiling for space within the building and trusses structurally supporting a roof covering for the building is assembled by arranging the panels in horizontal array, superposing an arrangement of trusses above the panels, adhering the panels and trusses together into a unitary roof and ceiling structure and then superposing the unitary roof and ceiling structure on side walls for the building.

3,722,172
DEVICE FOR AUTOMATICALLY VARYING THE OPERATING SPEED IN PACKAGING MACHINES FOR CIGARETTES
Ariosto Seragnoli, Bologna, Italy, assignor to G. D. Societa In Accomandita Semplice Di Enzo Seragnoli E Ariostu Seragnoli Via Pomponia, Bologna, Italy
Filed Aug. 19, 1971, Ser. No. 173,120
Claims priority, application Italy, Sept. 8, 1970, 3541 A/70
Int. Cl. B65b *57/12*
U.S. Cl. 53—54 **3 Claims**

Disclosed herein is a device for automatically varying the operating speed of a cigarette packaging machine in response

to the presence or absence of defective groups of cigarettes to be packaged. The device includes a sensing member for sensing the number of cigarettes in a group, and for sensing the amount of tobacco in each cigarette. Control means are provided to maintain the operating speed of the machine at a high rate until a defective group of cigarettes is sensed by the



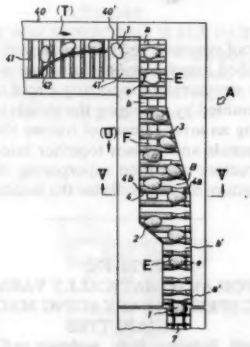
sensing member, whereupon the operating speed is decreased to prevent malfunctions which may otherwise result from operational changes due to the detection of such defective groups. The control means operates to again speed up the machine after a predetermined duration of sensing by the sensing member during which no defective groups of cigarettes are detected.

3,722,173

ALIGNMENT AND PACKAGING UNIT FOR EGGS

Hikoji Noguchi, 19, No. 2605, Aza Ko-Jizo-Shita, Oaza, Tokorozawa, Japan

Filed Dec. 7, 1971, Ser. No. 205,638
Int. Cl. B65b *57/10*
U.S. Cl. 53—62 **6 Claims**



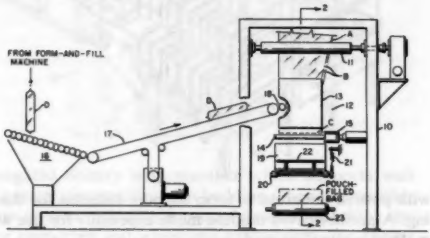
An egg alignment and packaging unit so designed and arranged that a number of eggs supplied at random are aligned and placed in a predetermined number and finally contained in an egg container, so that the egg packaging operation can be performed both positively and efficiently.

3,722,174

PACKAGING OF LIQUID-FILLED FLEXIBLE POUCHES IN THERMOPLASTIC BAGS

Jean Paul Bergevin, Kingston, Ontario, and Karl Otto Kuester, Collins Bay, Ontario, both of Canada, assignors to Du Pont of Canada, Limited, Montreal, P.Q., Canada

Filed May 18, 1971, Ser. No. 144,430
Claims priority, application Canada, June 19, 1970, 86,071
Int. Cl. B65b *9/08*
U.S. Cl. 53—182 **2 Claims**



A process and apparatus for continuously packaging liquid-filled flexible pouches in thermoplastic bags by:

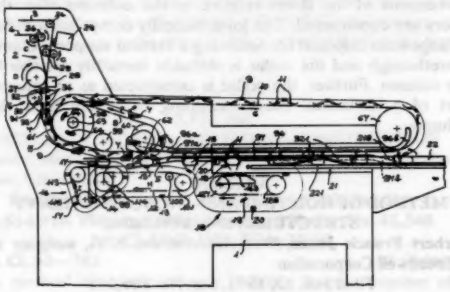
a. spreading a folded thermoplastic film over a pouch-receiving box wherein the fold forms the bottom of the bag;
b. heat-sealing the leading edges of the film to each other beneath the pouch-receiving box forming one closed side of the bag;
c. placing two or more liquid-filled packages in the pouch-receiving box;
d. heat-sealing the trailing edges of the film to each other over the pouch-receiving box forming another closed side of the bag; and
e. discharging the bag having one end open and containing the liquid-filled pouches.

3,722,175

RAPID PAPER WRAPPING MACHINE FOR SOAP-LIKE ARTICLES

Maurizio Maulini; Franco Aluola, both of Bologna, and Herbert Rueff, Croce Di Casalecchio, all of Italy, assignors to Azionaria Costruzioni Macchine Automatichi A.C.M.A. S.P.A., Bologna, Italy

Filed Sept. 8, 1971, Ser. No. 178,716
Claims priority, application Italy, Sept. 22, 1970, 3551 A/70
Int. Cl. B65d *11/12*
U.S. Cl. 53—209 **5 Claims**



A rapid paper wrapping machine for pieces of soap and the like articles comprising an input station for supplying a number of paper sheets, and output station for folding and

sealing the paper sheets on the lateral sides of the article to be wrapped, a feeder for the articles, a first line extending from the input station to the output station, a plurality of pairs of spaced jaw members along said line arranged to embrace the artocles on it, abutment members between each pair of jaw members, a second line adjacent to the first line and provided with a plurality of pincers, a third line adjacent to the first line provided with a plurality of spaced supports, a unit for expelling paper sheets from the input unit to the pincers, a pusher for transferring articles from the feeder to the support and abutment members, and cam elements along the first and second line to actuate the pincers and the abutment members in a proper time relationship.

3,722,176

PACKAGE HANDLING

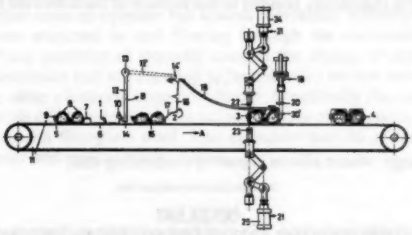
Adrianus Hordijk, Zaandam, Netherlands, assignor to Hordijk G., Houtindustrie Zoandam N.V., Zaandam, Netherlands

Filed April 5, 1971, Ser. No. 131,138

Claims priority, application Netherlands, April 7, 1970, 7004968

Int. Cl. B65b *7/26*

U.S. Cl. 53—376 **3 Claims**



A resilient plastic container having a box section and lid section formed with equal pluralities of complementary hollows or spaces to hold articles such as eggs and tomatoes and with closure means adapted to snap one into the other, is transported in an open position, lid section first, on a belt conveyor against a depending hook which moves the lid section to an upright position and then slips off while the container moves under a downwardly sloping guide plate under which the lid section is closed on top of the box section. The conveyor as well as the guide plate have slits through which plungers pinch the closure means together while the package is held by stop means helping to align the lid section with the box section.

3,722,177

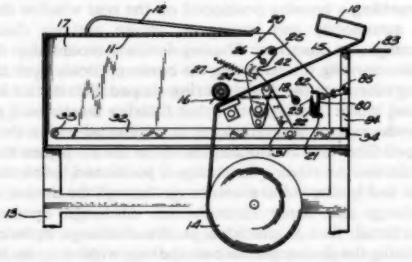
PACKAGE WRAPPING APPARATUS WITH PACKAGE ACTUATED WEB SEVERING TOOL

Charles E. Michels, Racine, Wis., assignor to Reliance Electric Company, Toledo, Ohio

Filed Feb. 14, 1971, Ser. No. 112,582

Int. Cl. B65b *11/56, 67/10*

U.S. Cl. 53—390 **2 Claims**



Package wrapping apparatus which has a wrapping table and a roll film stand is provided with a cooperating knife blade and web snubber to sever the web into lengths appropriate for wrapping the package. The web snubber and knife blade are mechanically actuated in time with the wrapping sequence under pressure of the package which is undergoing wrapping on the apparatus. The web severing tool parts are provided with motion transmitting linkages to a movable frame having a package rest. The movable frame is shifted under pressure of the package, thus to actuate the linkages and sever the web.

3,722,178

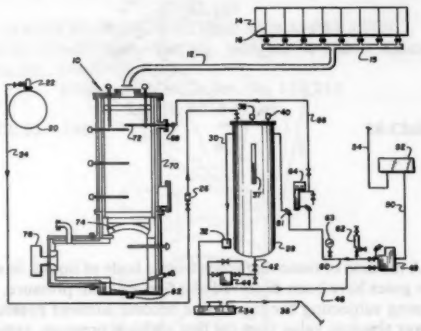
SULFUR TRIOXIDE VAPOR FOR DUST CONDITIONING

Harold H. Aaland, 12653 Killion Street, N., Hollywood, Calif., and James L. Ma, 2341 Dunswell Avenue, Hacienda Heights, Calif.

Filed June 24, 1971, Ser. No. 156,266

Int. Cl. B03c *3/01*

U.S. Cl. 55—4 **10 Claims**



A process and apparatus for heating, vaporizing and decomposing sulfuric acid for production of sulfur trioxide to be used in conditioning stack gases to be treated in an electrostatic precipitator.

3,722,179

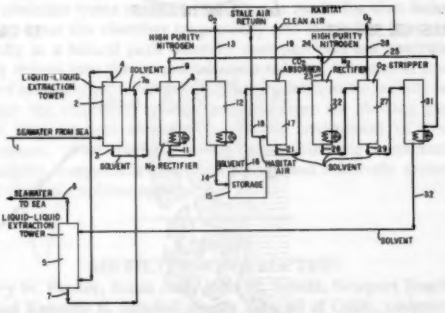
LIFE SUPPORT PROCESS AND SYSTEM USING SOLVENT EXTRACTION

Walter B. Moen, Erie, Pa., and Albert Halfon, Niskayuna, N.Y., assignors to Airco, Inc., Murray Hill, New Providence, N.J.

Filed April 16, 1970, Ser. No. 29,218

Int. Cl. B01d *53/18*

U.S. Cl. 55—40 **14 Claims**



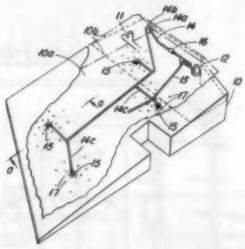
A life support system for an undersea habitat which derives oxygen directly from the sea without connection to shore or supply ships. Dissolved gases, including oxygen and nitrogen, are derived by liquid-to-liquid extraction from a stream of sea water. The gas-loaded solvent is first stripped of nitrogen, and then oxygen, in successive rectification processes, the oxygen passing into the habitat. Exhaust gas from the habitat is partially purified by passing it through fresh solvent, for absorption of carbon dioxide, after which it is recirculated in the

habitat. The solvent, containing essentially nitrogen and carbon dioxide, is again contacted by gas-stripped sea water, which reabsorbs the carbon dioxide and nitrogen, and returns to the sea.

3,722,180
DE-GASSING OF LIQUIDS

Harold T. C. Boucher, Thornbury, near Bristol; Christopher Frank Arthur Wheeler, Whitchurch, and John Martin West, Redland, all of England, assignors to British Aircraft Corporation Limited, London, England

Filed April 21, 1971, Ser. No. 136,023
Claims priority, application Great Britain, May 1, 1970, 21,090/70
Int. Cl. B01d *19/00*
U.S. Cl. 55—46 **5 Claims**

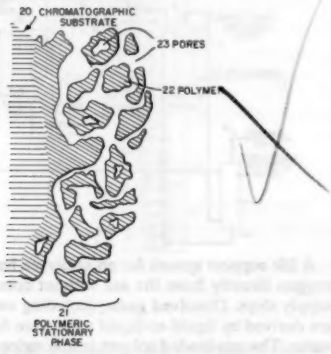


A method of removing gases from a body of liquid, in which the gases have been dissolved at a first ambient pressure, comprising subjecting the liquid to a second ambient pressure of lower absolute value than the first ambient pressure, removing a proportion of the liquid from the body, causing the removed liquid to liberate at least some of the gases dissolved therein in the form of bubbles, and discharging the bubble-containing liquid into the remainder of the body in such a manner that the bubbles pass through the body, thereby releasing at least part of the gases dissolved therein.

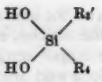
3,722,181
CHROMATOGRAPHIC PACKING WITH CHEMICALLY BONDED ORGANIC STATIONARY PHASES

Joseph J. Kirkland, and Paul C. Yates, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 22, 1970, Ser. No. 39,665
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **18 Claims**



A process for making a chromatographic packing having a polymeric stationary phase in which molecules having the formula



wherein R_3' is a hydroxyl, or an aliphatic or aromatic hydrocarbon monovalent radical, and

R_4 is a monovalent aliphatic or aromatic hydrocarbon radical,

are partially prepolymerized, chemically bonded to a polyvalent metal-containing substrate, the metal having a valence of 3–5, and further polymerized.

The polymeric stationary phase has a repeating unit of the formula

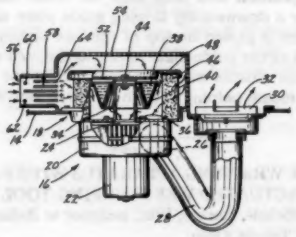
wherein A is —O— or a monovalent aliphatic or aromatic hydrocarbon radical,
and is chemically bonded to the surface of the substrate by an

linkage, where silicon is part of a repeating unit.

3,722,182
AIR PURIFYING AND DEODORIZING DEVICE FOR AUTOMOBILES

John E. Gilbertson, 2200 Ashworth Rd., West Des Moines, Iowa

Filed May 14, 1970, Ser. No. 37,120
Int. Cl. B03c *3/14*
U.S. Cl. 55—124 **2 Claims**

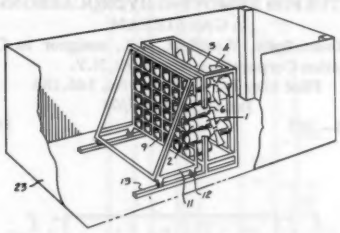


An air purifying and deodorizing device for an automobile comprising a housing positioned on the rear window deck of the automobile and having air intake and air discharge openings. An electronic filtering device is mounted at the air intake opening for removing air-borne particles from the air being taken into the device. A ring-shaped filter device is positioned in the housing for further filtering the air as it passes therethrough. A deodorant cup is positioned within the ring-shaped filter and deodorizes the air as the air passes through the device. An electric fan means is positioned below the rear deck and is adapted to draw the air through the device and to discharge the same through the discharge opening. A directional vent is provided at the discharge opening for directing the discharged air onto the rear window to de-fog the same. An optional purifying and deodorizing device may also be employed which is adapted to supply outside air into the interior of the vehicle and to purify and deodorize the same.

3,722,183
DEVICE FOR CLEARING IMPURITIES FROM THE ATMOSPHERE

John A. Gaylord, 31 Corte Ortega, Greenbrae, Calif.

Filed Feb. 16, 1971, Ser. No. 115,631
Int. Cl. B03c 3/06
U.S. Cl. 55—128 4 Claims

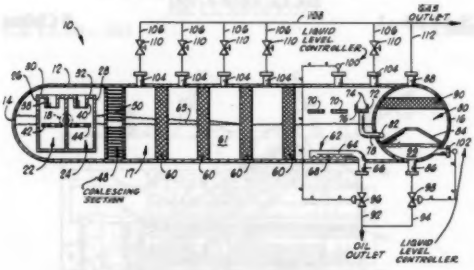


Oppositely charged electrode cones or electrode cylinders are adjustably supported so that one cone or cylinder is within the other cone or cylinder but spaced therefrom, whereby air currents attracted to and flowing through the electrostatic field have particles of impurity acquire the charge of one of the electrodes and are repelled to be collected on and adhere to the other electrode cone or cylinder. Specifically the cones are made of fiberglass and the adjacent faces of the cones are coated with fiberglass wool. The cylinders may be of larger diameter and may be made of steel.

3,722,184
APPARATUS FOR SEPARATING OIL AND GAS FROM A FOAMING CRUDE OIL STREAM

Robert E. McMinn, Oklahoma City, Okla., assignor to Black, Sivalls & Bryson, Inc., Oklahoma City, Okla.

Filed May 17, 1971, Ser. No. 143,998
Int. Cl. B01d 19/00
U.S. Cl. 55—174 8 Claims

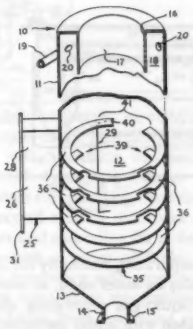


The present invention relates to improved apparatus for separating oil and gas from a foaming crude oil stream of the type which includes an elongate substantially horizontal vessel having a crude oil stream inlet at one end and oil and gas outlets at points removed from the inlet. By the present invention a coalescing section comprised of a plurality of smooth cylindrical plates positioned longitudinally and concentrically to provide annular flow passages therebetween is disposed within said vessel across the interior thereof and adjacent to the crude oil stream inlet so that gas, oil and foam from the crude oil stream pass through the annular flow passages and oil carried with the gas is coalesced and agglomerated on said plates and removed from the gas. A plurality of foam breaking pads are disposed in the vessel positioned in spaced relationship across the interior thereof on the side of the coalescing section away from the crude oil stream inlet, each of the foam breaking pads including knitted mesh having a texture to distort and break oil foam thereby releasing the gas held in the foam. An oil outlet from the vessel is provided positioned on the side of the last of the foam breaking pads away from the crude oil stream inlet, and a closed compartment is disposed within the vessel at the end thereof away from the crude oil stream inlet. A passageway is provided communicating the top portion of the vessel with the closed compartment so that gas separated from the crude oil stream and gas released from foam in the vessel is passed into the closed compartment. Gas and oil outlets from the closed compartment are provided, and a mist extractor pad is positioned across the closed compartment between the passageway and the gas outlet so that oil mist entrained in the gas passing through the compartment is removed therefrom.

3,722,185
GAS SCRUBBING METHOD AND APPARATUS

Gerhard Miczek, Louisville, Ky., assignor to Fisher Klosterman, Inc., Louisville, Ky.

Filed June 9, 1971, Ser. No. 151,213
Int. Cl. B01d 47/06
U.S. Cl. 55—238 16 Claims



Apparatus is provided for utilizing a liquid flow to remove particulate solids such as dust from industrial gases. The apparatus includes a contacting chamber having means therewith for providing a continuous water wash-down in the form of a substantially downward water sheet concentric to the chamber inner surface. Provision is made for dust-laden gas to enter the chamber tangentially and thereafter flow upwardly in a helical path whereby dust particles are centrifugally driven into the concentric water sheet. A means is provided inwardly adjacent the tangential inlet to substantially increase the efficiency of dust removal from the flowing gas. The latter means makes possible the attainment of performance, in a medium energy gas scrubbing apparatus, favorably comparable to a high energy and relatively expensive venturi scrubber apparatus.

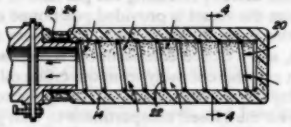
3,722,186
AIR FILTER CONSTRUCTION

Jerry W. Parker, Santa Ana; John W. Scholz, Newport Beach, and Kenneth E. Mitchell, Santa Ana, all of Calif., assignors to Uni Filter, Orange, Calif.

Filed Jan. 27, 1972, Ser. No. 221,199
Int. Cl. B01d 46/04
U.S. Cl. 55—304 4 Claims

An air filter construction adapted to be easily mounted to various carburetor intake openings, said air filter construction comprising a generally cylindrical filter element of open pore foam material or the like, a coil compression spring mounted in the interior of the cylindrical filter element for supporting

such in sealing engagement at one end thereof with the carburetor opening and including a plurality of substantially spaced



convolution along its length to assure unhindered flow of air through the filter element into the carburetor opening.

3,722,187

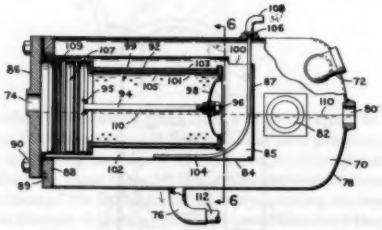
LIQUID AND GAS SEPARATING ASSEMBLY

Olin E. Potter, Wilbraham, and Biagio J. Tomasi, S. Hadley Falls, both of Mass., assignors to Worthington Corporation, Harrison, N.J.

Division of Ser. No. 809,187, March 21, 1969, Pat. No. 3,588,288. This application Aug. 21, 1970, Ser. No. 65,771

Int. Cl. B01d *50/00*

U.S. Cl. 55—323 **8 Claims**



A liquid and gas separating assembly for an air compressor. The assembly includes an outer shell, an inner shell within the outer shell and a liquid-gas separating element within the inner shell. A gas laden with liquid particles, such as oil laden air from an air compressor, is admitted to the outer shell in which a large amount of the entrained liquid settles out of the gas into a pool of stored liquid partially submerging the inner shell in the lower portion of the outer shell. The gas passes into the inner shell through an inlet above the pool of liquid and then through the liquid-gas separating element. The separated gas and liquid are removed from the two shells through different outlets.

3,722,188

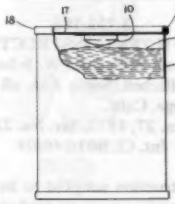
DESICCANT CAPSULE AND PACKAGE EMBODYING THE SAME

John S. Cullen, 138 Wesley Avenue, Buffalo, N.Y.

Filed Dec. 10, 1970, Ser. No. 96,853

Int. Cl. B01d *53/14*

U.S. Cl. 55—384 **2 Claims**



A capsule of a synthetic moisture-permeable material such as cellulose acetate contains a desiccant material such as calcium oxide and has an adhesive surface which is applied to the interior of a container whereby the capsule is exposed to moisture in the container or in the contents thereof but with the capsule attached to an interior container wall to prevent the same from being commingled with the contents of the container.

3,722,189

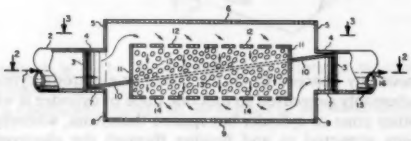
APPARATUS FOR REMOVING HYDROCARBONS FROM A GAS STREAM

John F. Tourtellotte, Westfield, N.J., assignor to Chemical Construction Corporation, New York, N.Y.

Filed May 24, 1971, Ser. No. 146,186

Int. Cl. B01d *53/04*

U.S. Cl. 55—389 **16 Claims**



A fluid-solid contactor is disclosed which provides maximum contact area with minimum displacement, by passing the fluid into a preferably cylindrical container containing a coaxial internal preferably cylindrical solids bed, and diverting the fluid by means of an annular inclined baffle to attain fluid flow through the bed. The invention is applicable to the removal of hydrocarbons from an engine exhaust gas by absorption into a solid absorbent.

3,722,190

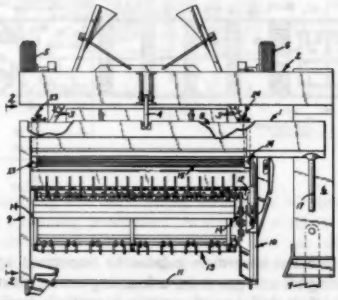
CONDITIONER ROLL MOUNTING MEANS AND CUSHIONING STOP SYSTEM THEREFOR

Ivan E. Fisher, Mankato, Minn., assignor to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed July 14, 1972, Ser. No. 272,011

Int. Cl. A01d *47/00*

U.S. Cl. 56—1 **8 Claims**



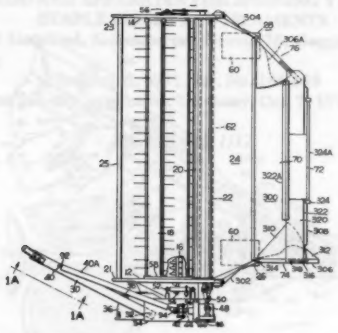
A pair of superposed parallel crop conditioner rolls, one journaled in a frame on a fixed axis, the other mounted for generally upward and downward movements toward and away from the one roll. Springs yieldingly urge the moveable roll towards the fixedly positioned roll, and stop elements limit movement of the moveable roll toward the fixedly positioned roll. Adjustment mechanism positions the moveable roll generally forwardly or rearwardly relative to a position vertically spaced from the axis of the fixedly positioned roll.

3,722,191

WINDROWING MEANS FOR AGRICULTURAL MACHINE

Benjamin A. Braunberger, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed Feb. 25, 1972, Ser. No. 229,466
Int. Cl. A01d 43/00
U.S. Cl. 56—189 6 Claims



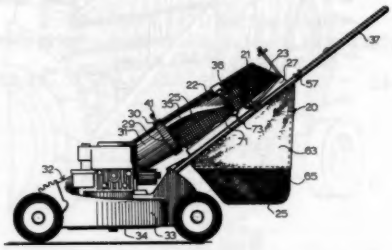
A tractor drawn and powered agricultural machine, such as a mower-conditioner for hay-like crops, comprises a main frame having a pair of spaced apart side walls between which a sickle mower, a tine reel, a pair of conditioning rolls, a crop gathering hood and windrowing means, and a pair of transport wheel assemblies are mounted. Operating power from the tractor is supplied through a rotatable power take-off shaft and clutches to a transmission unit which is connected to and drives the conditioning rolls and the sickle mower. The crop gathering hood and windrowing means are designed to deliver the crop in a swath or windrow in a fluffy condition which promotes drying and include adjustable side and rear shields.

3,722,192

GRASS-CATCHING AND BAGGING APPARATUS FOR ROTARY LAWN-MOWERS

Thomas J. Corbett, 12481 Mansbrook, Sterling Heights, Mich.

Filed Sept. 16, 1971, Ser. No. 181,088
Int. Cl. A01d 35/22
U.S. Cl. 56—202 7 Claims



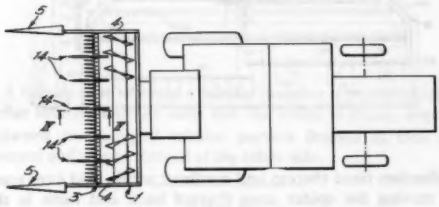
A grass-catching and bagging apparatus for rotary lawn-mowers having a duct discharging an air stream and entrained grass-cuttings. A perforate cowl is connected to the duct by a throat and has a depending flange for attaching a bag thereon. A deflector vane under the cowl leads from the throat and has an end curving downwardly centrally of the cowl and the bag thereon to direct the stream and cuttings down into the bag where the enlarged space expands and dissipates the air stream, drops the cuttings into the bag, and permits the air to rise upwardly around the downwardly centrally deflected air stream and escape through the perforate cowl. An imperforate hood over the cowl directs air escaping from the cowl endwise and sidewise. Back and side-walls on the hood deflect the escaping air downwardly while the open front deflects it forwardly. A sling supports the load in the bag attached to the cowl and sling side-walls contain the bag thereon. The sling and side-walls have perforate bottom portions and the downwardly deflected air from the hood is received within the sling and side-walls and is vented via their perforate bottom portions adjacent the ground remote from the breathing area of a user.

3,722,193

AUTOMATIC HEADER HEIGHT CONTROLLING MECHANISM

Gilbert J. Strubbe, Zedelgem, Belgium, assignor to Clayson N.V., Zedelgem, Belgium

Filed Oct. 21, 1971, Ser. No. 191,282
Int. Cl. A01d 67/00
U.S. Cl. 56—208 25 Claims



An automatic header height controlling mechanism for agricultural machines, more especially harvesters of the type having a header with a cutting mechanism for harvesting crops, whereby said automatic header height controlling mechanism comprises electrical position indicators which may be actuated by ground sensing members coupled to the side edges of the header and extending far in front of the header, in combination therewith a series of feeler elements provided rearwardly of and inbetween said ground sensing members, a header lifting rams controlling mechanism controlling the oil supply to and discharge from said rams and an electric servo circuit actuating said rams controlling mechanism, coupling said rams controlling mechanism to the electrical position indicators for forming a positioning circuit for generally positioning the header at a desired level above the ground on the one hand, and to the feeler elements for on contact thereof with an obstruction located inbetween the ground sensing members to raise the header, independant from the header positioning circuit on the other hand.

3,722,194

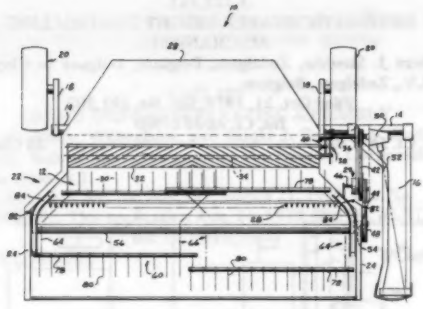
CONVERGING REEL ASSEMBLY HAVING A TINE CONTROL MECHANISM INCORPORATED THEREIN

Lawrence M. Halls, 567 East Jackson St., New Holland, Pa.

Filed Dec. 30, 1971, Ser. No. 213,861
Int. Cl. A01d 57/02
U.S. Cl. 56—226 18 Claims

In a mower-conditioner having a header with a sickle bar transversely mounted therein for cutting a swath of crop material of given width, a pair of transversely disposed conditioning rolls spaced rearwardly of said sickle bar and of less width than said sickle bar, a converging reel assembly mounted transversely above said sickle bar and adapted to engage a swath of crop material corresponding to the width of said sickle bar and converge that crop material into a narrower swath where the crop material may be readily received by said conditioning rolls. The converging reel assembly of the present invention generally comprises a pair of reel sections, each reel section rotatively mounted about one side of a transverse axis within said header and including outer and inner laterally spaced spiders with each spider having a plurality of radially extending spider arms. Each spider arm is pivotally

mounted for movement in the direction of said transverse reel assembly axis. Corresponding spider arms of each reel section are interconnected by a tine bar with the tine bar being rotatively mounted therebetween and including a series of tines extending therefrom. A cam structure is fixedly disposed adjacent each outer spider and includes a cam track curved inwardly about the rear portion thereof adjacent said conditioning rolls. Each outer spider arm includes a cam following



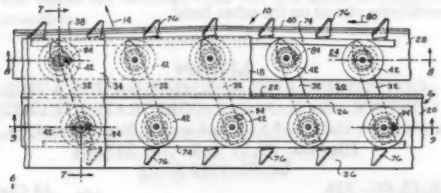
mechanism fixed thereto and confined within said cam track for moving the spider arms thereof back and forth in the direction of the transverse reel assembly axis as the reel assembly is rotated. A linkage structure responsive to the back and forth movement of the spider arms is connected to said tine bars and is operative to rotate the tine bars and consequently vary the attitude of the tines extending therefrom in response to the back and forth movement of selected spider arms.

3,722,195

CUTTER BAR FOR MOWER

Joseph C. Hurlburt, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 24, 1970, Ser. No. 66,370
Int. Cl. A01d *55/24*
U.S. Cl. 56—245 **8 Claims**



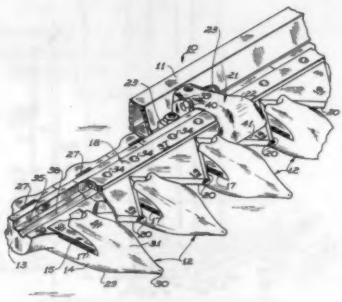
An impact type cutter bar unit utilizing an endless belt type cutter assembly having cutters spaced along the same and projecting laterally outward from the outer face of the belt for free impact engagement with agricultural material to be cut thereby, the cutter assembly being supported and guided by pulleys and driven by a drive pulley connected to power means, and including a simple, rigid Z-shaped main supporting bar providing elongated rigidity and upper and lower compartments in which the opposite elongated courses of the belt-type cutter assembly travel. The cutter bar unit also has vibration-inducing mechanism in the form of unbalanced pulleys to aid in freeing the cutters of debris.

3,722,196

CUTTER BAR ASSEMBLY

Willaim E. Templeton, 1807 West Hanley Road, Lexington, Ohio

Continuation-in-part of Ser. No. 104,354, Jan. 6, 1971, abandoned. This application May 19, 1971, Ser. No. 145,052
Int. Cl. A01d *55/02*
U.S. Cl. 56—298 **11 Claims**



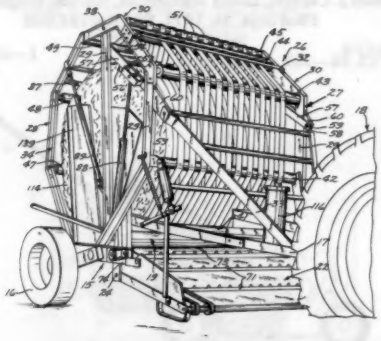
A cutter bar assembly including an improved sickle support system whereby each of the guards has an integrally formed upwardly facing bearing surface extending the entire width of the guard in the area to the rear of its ledger plate. The bearing surfaces are juxtaposed such that together they extend the entire length of the sickle. A plurality of hold-down brackets overlie the sickle at regularly spaced positions and are adjustable to provide appropriate clearances.

3,722,197

METHOD AND MACHINE FOR FORMING A LARGE ROUND BALE OF A FIBROUS MATERIAL

Gary J. Vermeer, P.O. Box 200, Pella, Iowa

Filed Jan. 3, 1972, Ser. No. 214,833
Int. Cl. A01d *39/00*
U.S. Cl. 56—341 **6 Claims**



The method and machine is for forming large round bales about 7 feet in diameter, 6 feet long and weighing about a ton and a half. The machine has a portable frame provided with pickup device for gathering and delivering windrowed material on to a horizontal rearwardly moving belt conveyor. Cooperating with the horizontal conveyor is an endless belt assembly movable in a generally upright circular path and including a lower extensible section that is initially movable adjacent to and in the opposite direction of the horizontal conveyor so as to form with the horizontal conveyor a baling zone. As the bale within the baling zone increases in size, the extensible section is automatically and progressively extended about the bale, in response to such increase, against a

predetermined tension or pressure constantly applied on the belt assembly. A completed bale is thus compact and of a uniform density over all portions thereof. After being formed the bale can be released in the field, or carried by the machine to a desired storage location.

3,722,198

METHOD AND APPARATUS FOR SPINNING YARNS OF STAPLE FIBERS AND FILAMENTS

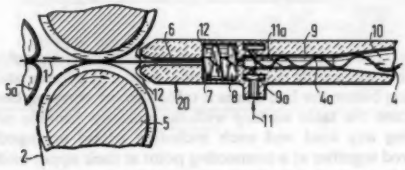
Konrad Gotzfried, Gabelsberger Strasse 75, Goggingen, Germany

Filed Oct. 5, 1971, Ser. No. 186,655

Claims priority, application Germany, Oct. 7, 1970, P 20 49 186.5

Int. Cl. D01h *1/12*

U.S. Cl. 57—58.89 **10 Claims**



In a pneumatic spinning apparatus, loose fiber ends are spread laterally from a sliver of staple fibers before the sliver is twisted with a sliver of continuous filaments into a yarn in a tube by a helical air stream. The loose fiber ends form a surface layer of the yarn which is deposited last and is therefore less tightly through than the core predominantly consisting of the continuous filaments and the remainder of the staple fibers. When the twisting air and the tightly spun yarn pass into a chamber of much greater cross section, the twisting action of the air on the yarn is relaxed, and the yarn untwists until the twist in the surface layer or shell is reversed to balance the reduced twist in the core. Backward propagation of the twist toward the intake end of the apparatus is prevented by a brake consisting of a screw whose flights bound a helical guide duct. The slivers move thorugthe duct in frictional engagement with the stem of the screw and start twisting as they approach the end of the duct near the twisting zone.

3,722,199

CAN SPINNING FRAME

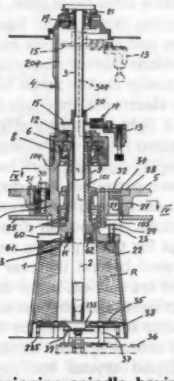
Adriano M. Gardella, 24 B, Via al Capo di Santa Chiara, Genoa, Italy

Filed May 4, 1971, Ser. No. 140,049

Claims priority, application Italy, May 8, 1970, 12672 A/70

Int. Cl. D01h *1/08, 7/74*

U.S. Cl. 57—77 **21 Claims**



A centrifugal can-spinning spindle having its three components, i.e., bell-shaped can, distributing tubular thread guide and pre-twisting tubular thread guide, all mounted on a single common support member for mounting as a unit on a spinning frame.

3,722,200

BOLSTER CASE FOR TEXTILE SPINNING AND DRAWING MACHINES

Loyal H. Tingley, Jr., Box 406, Havana, Ill.

Division of Ser. No. 681,351, Nov. 8, 1967, Pat. No. 3,497,946.

This application Dec. 23, 1969, Ser. No. 1,905

Int. Cl. D01h *7/12*

U.S. Cl. 57—130 **3 Claims**

A bolster case wherein a tubular member is provided with a collar intermediate its ends and the collar is firmly engaged between an enlarged tubular portion formed at one side thereof and a bead formed at the other side.

3,722,201

HIGH TENSILE STRENGTH CHEMICAL RESISTANT REINFORCED ASBESTOS YARN PRODUCTS

James Joseph Whalen, Washington Township, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Filed April 21, 1971, Ser. No. 136,174

Int. Cl. D02g *3/20*

U.S. Cl. 57—144 **8 Claims**

A high tensile strength and chemical resistant asbestos yarn product comprising a composite of a core strand of multiple filaments composed of fluorocarbon resin and overlying staple asbestos fiber twisted thereabout with portions of some of the staple asbestos fiber lodged intermediate individual filaments of the multifilament core strand.

3,722,202

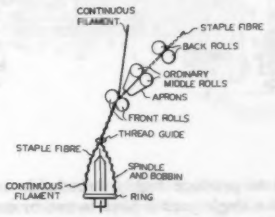
SPINNING A FILAMENT-WRAPPED STAPLE FIBER CORE YARN

Rafael Audivert Indarte, Barcelona, Spain, assignor to The United States of America as represented by the Secretary of Agriculture

Filed Sept. 24, 1971, Ser. No. 183,396

Int. Cl. D02g *3/04, 3/36*

U.S. Cl. 57—144 **2 Claims**



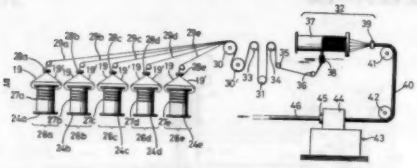
Continuous filament nylon of from 15 to 40 denier has been wrapped and twisted around a cotton core during spinning to produce yarns which are superior in uniformity, strength, and strength variability and can be spun at much higher speeds than the cotton control.

3,722,203

METHOD FOR CONTINUOUSLY MANUFACTURING A COMMUNICATION CABLE

Hisateru Akachi, Kanagawa-ken, Japan, assignor to Oki Densen Kabushiki Kaisha, Kanagawa-ken, Japan, a part interest

Filed Oct. 29, 1970, Ser. No. 85,212
Claims priority, application Japan, Nov. 15, 1969, 44/91494
Int. Cl. H01b 13/04
U.S. Cl. 57—160 4 Claims



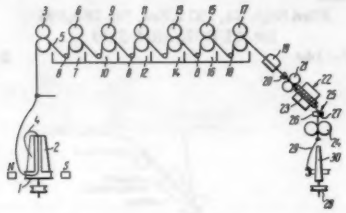
A method and an apparatus therefor of manufacturing a communication cable, comprising a primary stage in which a plurality of insulated conductors are wound on each of a plurality of identical winding reels and a secondary stage in which the winding reels are now used as feeding and twisting reels and in which the conductors wound on each of the feeding and twisting reels are twisted into a strand and a plurality of the thus formed strands are further twisted into a stranded cable which is thereafter coated with a protective sheath. The three major steps of the secondary stage are carried out all continuously.

3,722,204

APPARATUS FOR PRODUCING HIGHLY STRETCHABLE TWIST COTTON YARN

Elena Ernestovna Tsirkel, ulitsa Bela Kuna, 19; Ljudmila Nikolaevna Stepanova, ulitsa Schevchenko, 17; Antonina Vasilievna Schiptsova, ulitsa Bestuszhevskaya II; Nina Alexandrovna Tsareva, ulitsa Basseinaya, 63; Andrei Maximilianovich Nessler, ulitsa Bela Kuna, 19, all of Leningrad, and Idal Aizikovich Vishnyak, ulitsa Universitetskaya, 371, kv. 39, Tashkent, all of U.S.S.R.

Filed Nov. 9, 1970, Ser. No. 87,944
Int. Cl. D02g 3/40; D01h 13/30
U.S. Cl. 57—164 1 Claim



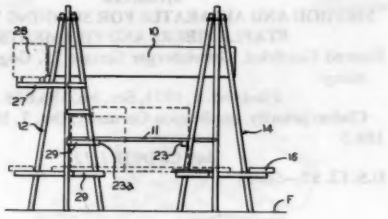
A method to produce highly stretchable twisted cotton yarn, wherein a single yarn is plied in two or more folds, and twisted in the direction of the single yarn twist, then the resulting plied yarn is treated in a bath with an alkaline solution, neutralized by acid, and water-washed, whereupon the yarn is impregnated with thermosetting resins, squeezed, dried, heat cured, and then straightened out and untwisted, thereby giving it a twist in the direction opposite to that of the plied yarn, thereby to produce a highly stretchable twisted cotton yarn.

3,722,205

FURNITURE STRUCTURE

Theodore H. Meyer, 417 Summit St., Barrington, Ill.

Filed March 16, 1971, Ser. No. 124,859
Int. Cl. A47c 17/40, 7/03
U.S. Cl. 5—8 11 Claims



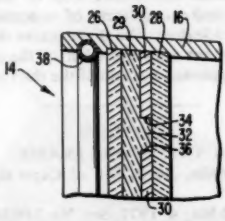
An improved article of furniture with four uprights adjustably supporting near their upper ends a bed frame and supporting below the bed frame a table surface carrying benches adjacent the table surface with the uprights capable of supporting any load and each including tripod arranged legs secured together at a connecting point at their upper ends and spread apart at their lower ends with connecting members limiting the spreading movement of the legs.

3,722,206

SELF-ILLUMINATED LIQUID CRYSTAL TIMEPIECE

John M. Bergey, Lancaster, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Continuation of Ser. No. 794,551, Jan. 28, 1969, abandoned.
This application March 1, 1971, Ser. No. 119,806
Int. Cl. G04b 19/30
U.S. Cl. 58—50 R 16 Claims



The time piece includes seven-bar-segment digital time indicating displays, the segments being selectively actuated by a time indicating source through a logic circuit. In one form, the display face includes a clear front glass, a dark back reflector glass spaced from the front glass, liquid crystals disposed between the glasses and an electrode material formed on the back glass with portions thereof removed while the remaining portions form electrodes for the seven bar segments. Selected energization of the electrodes energizes the liquid crystal segments to provide a light scattering effect whereby light incident to the energized liquid crystal segments is reflected to provide a digital display against a dark background. A nuclear powered light source surrounds the display face to provide light incident to the energized liquid crystals for digital display under dark conditions. In another form, the front glass is coated white except for the segments and a nuclear powered light source is located behind the rear clear glass plate on which the electrodes are carried. In the daytime, the energized bar segments reflect light rendering the same indistinguishable from the white opaque surface whereby the natural dark color of the nuclear light source appears through the nonenergized and transparent liquid crystal bar segments providing a daytime digital time display. For night-time display, the nuclear powered light source transmits light through the

nonenergized liquid crystal bar segments to provide the digital time display.

3,722,207

UNIVERSAL TIMEPIECE

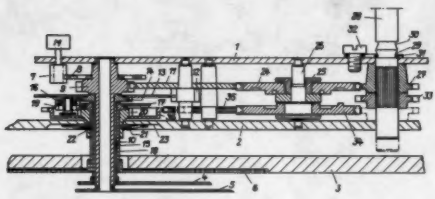
Claude Challandes, Sonceboz, Switzerland, assignor to Centre Electronique Horlager S.A., Brequet, Neuchatel, Switzerland

Filed May 17, 1971, Ser. No. 144,128

Claims priority, application Switzerland, May 22, 1970, 7656/70

Int. Cl. G04b *19/22, 27/00*

U.S. Cl. 58—42.5 7 Claims



A universal timepiece comprises a disc driven by means comprising meshing first and second planet wheels pivotally mounted on a rotatably carrier angularly fixed with the disc, the first planet wheel meshing with a pinion in an hours hand driving train, and the second planet wheel meshing with a solar pinion. The solar pinion is normally angularly fixed, but a setting train for the disc meshes with the solar pinion to enable rotation thereof.

3,722,208

HERMETIC WATCH-CASE

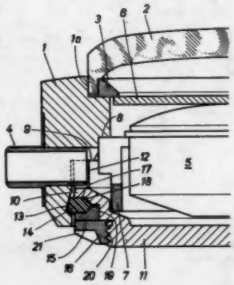
Raymond Ryser, Renan, Switzerland, assignor to Manufacture de Boites de Montres S. Graber S.A., Renan (Canton of Berne), Switzerland

Filed June 5, 1972, Ser. No. 259,692

Claims priority, application Switzerland, June 11, 1971, 8538/71

Int. Cl. G04b *37/08*

U.S. Cl. 58—90 R 8 Claims



A hermetically sealed watch case in which the middle and the back define between them a groove for an elastic sealing ring. A rigid ring is provided to compress the elastic sealing ring and this ring is activated by a threaded piece, the threads of which are separated from the interior of this watch case so that the latter is protected from any fine cuttings resulting from turning the threaded piece.

3,722,209

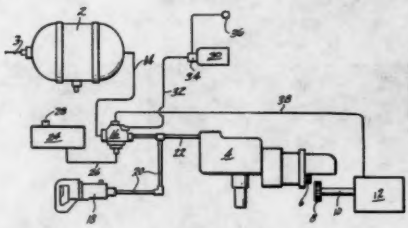
ENGINE-STARTING SEPTEM

James Kaytor, Route 1, W. Frankfort, Franklin, Ill.

Filed April 9, 1971, Ser. No. 132,746

Int. Cl. F02b *67/00*; F01b *27/00*

U.S. Cl. 60—6 5 Claims



A combination relay and check valve for use with a fluid actuated engine starting system. The valve includes a housing which contains a diaphragm connected to a valve. The valve divides the housing into inlet and outlet chambers. A lubricant reservoir is contained in the housing and means are provided to inject a charge of lubricant into the chambers when the valve is opened. Excessive pressure in the outlet chamber acts on the diaphragm to close the valve and means are provided to selectively close off the source of control pressure from the diaphragm so that the valve cannot be opened when the engine is running.

3,722,210

ROTARY PNEUMATIC STARTER DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE

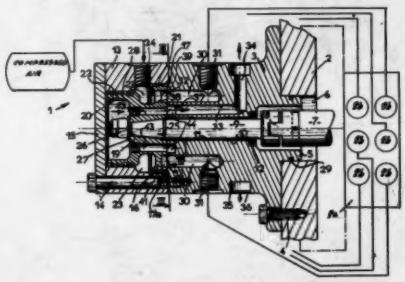
Karl Kuhn, 78 Saint-Germain-En-Laye, France, assignor to Societe D'Etudes de Machines Thermiques, Saint-Denis, France

Filed Jan. 25, 1971, Ser. No. 109,439

Claims priority, application France, Jan. 23, 1970, 7002475

Int. Cl. F01b *29/04*; F02n *9/04*

U.S. Cl. 60—16 10 Claims

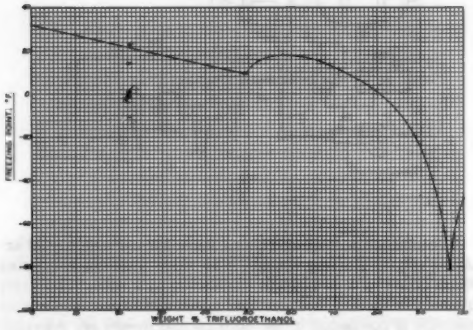


An automatic rotary distributor for compressed air starting of a multicylinder internal combustion in particular Diesel engine with a cam shaft-driven rotary distributor disk receiving compressed air on one side while being in sliding tight pressure contact by its opposite side with the complementary side of a stationary distributor body, said disk being so shaped that the incoming compressed air acts only upon a circular annular concentric portion of said disk which is thereby applied with a reduced resulting total pressure force against said body.

3,722,211
PRIME MOVER SYSTEM UTILIZING TRIFLUOROETHANOL AS WORKING FLUID

Rex C. Conner, Englewood, and Louis L. Ferstandig, Ridgewood, both of N.J., assignors to Halocarbon Products Corporation, Hackensack, N.J.

Filed Sept. 28, 1970, Ser. No. 75,904
Int. Cl. F01k 25/10
U.S. Cl. 60—36 10 Claims

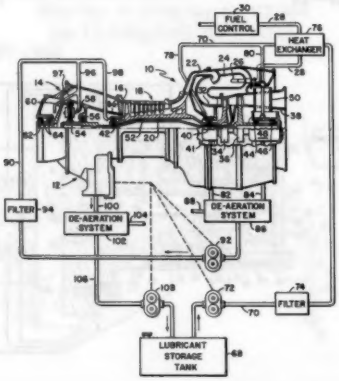


An anti-pollution heat engine including a prime mover system wherein the working fluid comprises trifluoroethanol, preferably containing about 3 to 25 percent of water by weight.

3,722,212
GAS TURBINE ENGINE LUBRICATION SYSTEM

Wolfgang J. Stein, Milford, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed March 4, 1971, Ser. No. 120,853
Int. Cl. F02c 7/06
U.S. Cl. 60—39.08 8 Claims

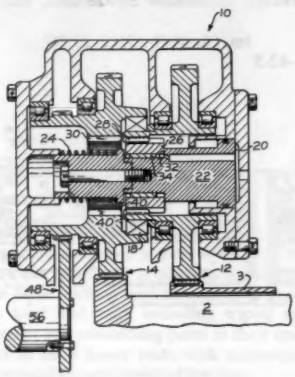


The disclosure illustrates a gas turbine engine lubrication system comprising a pump that pressurizes oil and delivers it through a heat exchanger to the engine bearings located in a hot region of the engine. From there the lubricating fluid is deaerated and repressurized without passing it through a heat exchanger for delivery to the bearing assemblies located in the cooler region of the engine. This lowers the heat rejection of the engine and minimizes the heat exchanger requirements.

3,722,213
GEAR TRAIN FOR GAS TURBINE ENGINES

Carl W. Carter, Peoria, and Lloyd E. Johnson, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 25, 1971, Ser. No. 109,393
Int. Cl. F02c 3/10, 7/02
U.S. Cl. 60—39.16 R 1 Claim

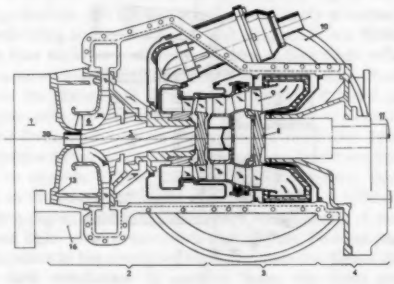


A triple lay shaft gear train for a two-shaft gas turbine engine. The gear train includes a lay shaft mounted overrunning clutch which permits a uni-directional lock-up of the power turbine and gasifier turbine when synchronous speeds have been reached and a positive lock-up coupling means which permits selective bi-directional lock-up of the lay shafts to provide the advantages of both single-shaft and two-shaft turbine operation. The gasifier turbine and power turbine are capable of different rotational speeds.

3,722,214
GEARBOX FOR CONTROLLING THE MECHANISMS OF A GAS TURBINE ENGINE HAVING ROTARY HEAT EXCHANGERS

Jack Guillot, 19 rue Voltaire, Juvisy sur Orge, France

Filed Aug. 12, 1970, Ser. No. 63,217
Int. Cl. F02c 7/20
U.S. Cl. 60—39.31 10 Claims



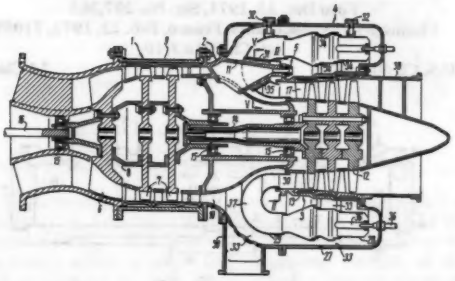
A gearbox for driving the various accessories of a gas turbine provided with rotating heat exchangers. The gearbox has a triangular shape and fits on the front of the turbine. An electric starter is mounted on the gearbox casing parallel to the longitudinal axis of the turbine and extends under one end of the turbine.

3,722,215

GAS-TURBINE PLANT

Konstantin Ivanovich Zhdanov, Prospekt Pobedy, 19; Alexandr Grigorievich Tomilin, ulitsa Kalinina, 28, kv. 22; Anatoly Mikhailovich Polyakov, ulitsa Kalinina, 28, kv. 27; Andrei Alexandrovich Luznin, ulitsa Kalinina, 22/36 kv. 18; Gennady Petrovich Kaimov, ulitsa Pervomaiskaya 35, kv. 52, all of Stupino Moskovskoi oblasti; Jort Nikolaevich Vasiliev, Ploschad Vosstania, 1, kv. 60, Moscow; Nikolai Andreevich Sheremet, ulitsa Novogireevskaya, 13, kv. 52, Moscow; Jury Georgievich Bekhli, Prospekt Mira, 118a, kv. 211, Moscow, and Evgeny Petrovich Federov, Moskovsky Prospekt, 52, kv. 7, Moscow, all of U.S.S.R.

Continuation of Ser. No. 815,668, April 14, 1970, abandoned.
This application March 30, 1971, Ser. No. 129,577
Int. Cl. F02c
U.S. Cl. 60—39.32 23 Claims



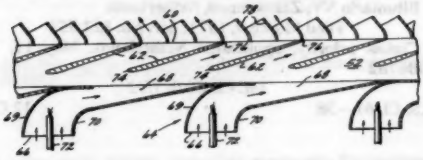
A gas-turbine plant in which the turbine in enclosed in an annular combustion chamber and the inlet portion of the stator of the turbine is connected to the stator of the compressor through the intermediary of the body of the diffusor in such a manner that it is possible to compensate temperature deformations of said body of the diffusor and stator of the turbine. To obtain a compact plant possessing good operating characteristics use is made of a compressor whose first stage is made diagonal and whose subsequent stages are axial.

3,722,216

ANNULAR SLOT COMBUSTOR

Donald W. Bahr, and Daniel L. Harshman, both of Cincinnati, Ohio, assignors to General Electric Company

Filed Jan. 4, 1971, Ser. No. 103,604
Int. Cl. F02c 3/00
U.S. Cl. 60—39.36 15 Claims



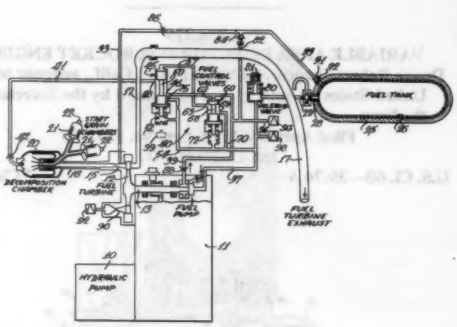
A combustion system for a gas turbine engine is equipped with a fuel carbureting device which delivers a uniform fuel/air mixture to the primary combustion zone through a continuous annular slot. Fuel and air are provided as a continuous tangential flow to an annular premixing chamber, which is configured so as to provide an exit which comprises the continuous annular slot. Radial swirl vanes are positioned within this slot to turn the fuel/air mixture axially, while counterswirl vanes surround the slot to provide additional primary combustion air to rapidly mix with the fuel/air mixture and to provide flame stabilization regions around the entire annular combustion chamber.

3,722,217

AUXILIARY HYDRAULIC POWER SUPPLY

Richard W. Reynolds, and Kent Weber, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed March 3, 1971, Ser. No. 120,424
Int. Cl. F04b 17/00
U.S. Cl. 60—39.48 17 Claims



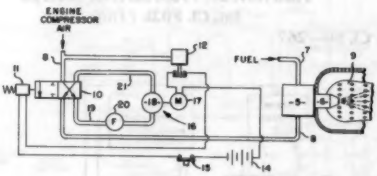
An emergency hydraulic power supply for providing hydraulic power to an aircraft system in event of engine failure including a hydraulic pump, a hot gas turbine for driving the pump, a decomposition chamber for decomposing fuel to provide hot gas for driving the turbine, a fuel storage tank, pump means for delivering fuel from the tank to the decomposition chamber, conduit means connecting the pump outlet and the decomposition chamber, means for conducting hot gas from the decomposition chamber to the fuel tank for pressurizing the fuel to force the latter toward the pump means, means utilizing tank pressure for purging the conduit means on pump shutdown, and coupling means for using external fluid under pressure for testing operation of various components without decomposition of fuel.

3,722,218

AIR BOOST FUEL ATOMIZING SYSTEM

Dominic J. Lapera, Chardon, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Dec. 4, 1970, Ser. No. 95,312
Int. Cl. F02g 1/00
U.S. Cl. 60—39.74 R 10 Claims



An air boost fuel atomizing system for a gas turbine engine or the like operative to supply compressed air to atomizing fuel injection nozzles during starting of the engine until the engine compressor discharge pressure exceeds the combustion chamber pressure by a prescribed amount such as to obtain efficient atomization and combustion of the fuel on compressor air alone, and when that occurs at say, 80 percent of the maximum turbine shaft speed which may vary from engine to engine, the air boost fuel atomizing system is de-energized. In one system according to this invention, the boost blower or compressor is in series between the engine compressor and the fuel-air manifold so as to deliver to the latter increased air pressure as required during starting of the engine and until the engine attains a predetermined speed, after which the engine compressor discharge pressure is itself sufficient to sustain ef-

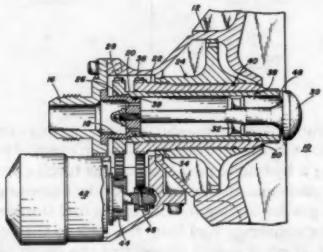
ficient atomization and combustion. In another system according to the present invention, the boost compressor has an atmospheric intake port and a discharge port communicating with a high pressure air reservoir from which air is conducted to the fuel-air manifold via a pressure regulator during starting of the engine and until the engine compressor air is of sufficient magnitude to sustain efficient atomization and combustion at which time the air boost system is de-energized.

3,722,219

VARIABLE AREA INJECTOR FOR ROCKET ENGINE

Duane Robert Spencer, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 26, 1971, Ser. No. 137,633
Int. Cl. F02g *1/00*
U.S. Cl. 60—39.74 A **2 Claims**



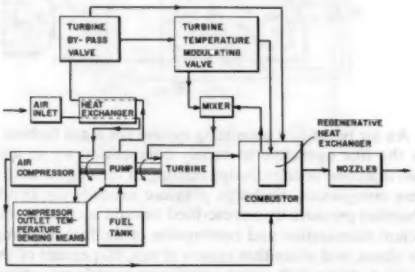
A device for varying the thrust of a rocket engine either before or during flight, and for adjusting the mixture ratio easily and quickly during engine burn. A variable area fuel injector having concentric sleeves which are independently axially moveable for respectively controlling the flow of fuel and oxidizer independently of one another is provided for this purpose. These sleeves are threadably engaged with the rocket and a fixed pintle therein for permitting this axially movement.

3,722,220

REACTION PROPULSION ENGINE AND METHOD OF OPERATION

Robert L. Wolf, Chesterfield County, Va., and Rodney McGann, Northridge, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 20, 1963, Ser. No. 325,118
Int. Cl. F02k *11/00*
U.S. Cl. 60—267 **2 Claims**



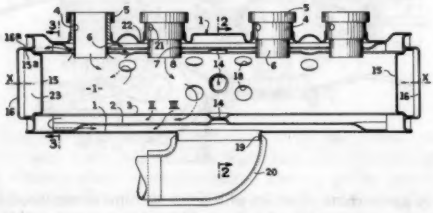
1. A reaction propulsion system including means providing a combustion chamber having an impulse expansion outlet nozzle therefrom, means providing a ram air intake, means directing air from the ram air intake to the combustion chamber, a fuel storage chamber, heat exchange means in heat exchange contact with the air in said air directing means, means directing fuel from said storage chamber through said heat exchange means, an air compressor providing a portion of the air directing means between the heat exchange means and said combustion chamber, a direct expansion turbine for driving said compressor, means directing at least a portion of fuel from said heat exchange means through the direct expansion turbine and then into said combustion chamber, a regenerative heat exchanger in said combustion chamber, and means for selectively directing a portion of the fuel passing through said heat exchanger to said regenerative heat exchanger and then to the turbine.

3,722,221

POST-COMBUSTION REACTOR FOR EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Jean Chopin, Rueil-Malmaison, and Jacques Eloy, Montbeliard, both of France, assignors to Automobiles Peugeot, Paris, France

Filed Dec. 13, 1971, Ser. No. 207,363
Claims priority, application France, Feb. 22, 1971, 7105970
Int. Cl. F01n *3/10*
U.S. Cl. 60—282 **14 Claims**



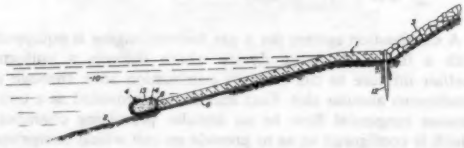
A treating reactor for exhaust gases of an internal combustion engine. It has three concentric tubular walls defining concentric chambers which intercommunicate. Inlet pipes connected to the outer wall extend through the inner walls with clearance and put the innermost chamber in communication with the exhaust pipes of the engine. An outlet connected to the outer wall puts the outermost chamber in communication with the exterior. The tubular walls are interconnected in pairs in a plane perpendicular to the axis of the reactor. The fixing points of one pair are staggered with respect to the fixing points of the other pair in said plane. Slidable guide means slidably interconnect adjacent end portions of the tubular walls.

3,722,222

SUPPORT MEANS FOR SLOPE REVETMENTS

Gerardus Rinkel, 's-Hertogenbosch, Netherlands, assignor to Bitumarin NV, Zaltbommel, Netherlands

Filed March 9, 1971, Ser. No. 122,551
Claims priority, application Netherlands, May 11, 1970, 7006762
Int. Cl. E02b *3/12*
U.S. Cl. 61—38 **12 Claims**



A method and means is provided for protecting slope revetments of banks and of harbor basins and waterways against crumbling under the water line. The method includes the step of supporting the foot of the revetment with an oblong body

which extends in the longitudinal direction of the slope and which is suspended from a carrier. This carrier rests at least in part on the slope and is covered by the revetment.

3,722,223

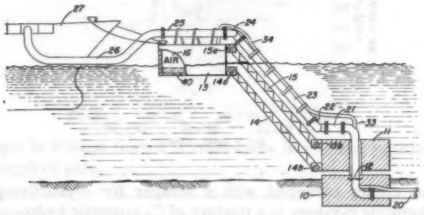
SUBMERSIBLE SINGLE POINT MOORING FACILITY

Ronald L. Gratz, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 22, 1971, Ser. No. 165,222

Int. Cl. B63b *21/00*; B65b *3/00*

U.S. Cl. 61—46 **2 Claims**



A submersible single point mooring facility for a bed of water which includes a mounting affixed to the bed of the body of water, a base mounted by means of a swivel to the mounting which permits 360° horizontal rotation of the mounting about the base, a buoy which is attached by means of a rigid arm to the base such that the arm is pivotally attached to the base and pivotally attached to the buoy, and means for floating the buoy or submersing the buoy such that the single point buoy can be floated during loading location and subsequently submersed to protect the buoy from accidental impact by passing ships or damage from surface ice.

3,722,224

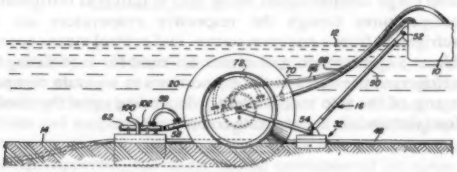
SUBMARINE PIPELINE TRENCHER

Lynn H. Roy, 317 Alamo St., Lake Charles, La.

Filed Feb. 8, 1971, Ser. No. 113,500

Int. Cl. B63b *35/04*; E02f *5/02*

U.S. Cl. 61—72.4 **12 Claims**



A submerged bottom travelling apparatus for movement along behind a surface vessel, either by its own motive power or by towing, and operable to form and lay a pipe in a bottom trench. The apparatus includes a pair of large supporting wheels for rolling along the bottom and depressing the bottom surface along closely spaced parallel paths and weter-jet and water-vacuum structure is also provided for removal, by erosion and vacuuming, of the bottom material disposed between the paths of movement of the large support wheels on the bottom. Further, the apparatus includes guide structure operable to move along a pipe or submarine cable being unwound by the surface vehicle or a preceding surface vehicle and to guide the pipe or submarine cable into the trench being formed.

3,722,225

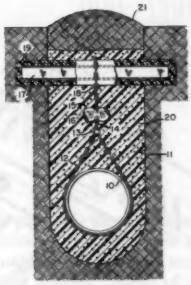
PIPELINE SUSPENSION SYSTEM

Herbert G. Empson, 2027 Lynwood Terrace, San Jose, Calif.

Filed Nov. 2, 1970, Ser. No. 86,236

Int. Cl. F16l *1/00, 3/00*

U.S. Cl. 61—72.1 **9 Claims**



The pipe is suspended in spaced relation within a ground trench by a chain sling connected to a cross beam by a shock absorber. The pipe and such suspension are fully enclosed by plastic foam formed in place or applied as a wrapping.

3,722,226

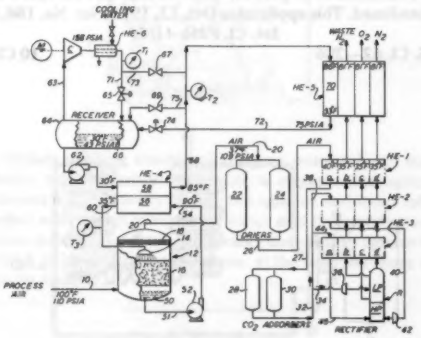
PROCESS GAS FORECOOLING SYSTEM

Richard L. McDermott, Somerset, and Scott A. Mueller, North Plainfield, both of N.J., assignors to Airco, Inc., New York, N.Y.

Filed March 25, 1970, Ser. No. 22,482

Int. Cl. F25j *3/00, 3/03*

U.S. Cl. 62—13 **7 Claims**



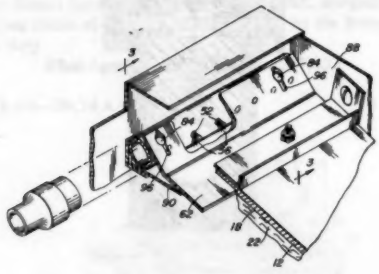
Forecooling system for a pressurized stream of warm, water-saturated process gas comprising a cooling tower wherein the gas stream is water-cooled and then directed to dryers and processing means, a first heat exchanger for cooling the tower water by a fluorocarbon refrigerant, a compressor and receiving tank for supplying the refrigerant, a second heat exchanger for cooling the exhaust refrigerant from the first exchanger by end-process product gas, and an expansion valve in a refrigerant return line between the second exchanger and receiving tank: an alternate method for directly cooling the process gas stream in the first heat exchanger.

3,722,227

WATER DISTRIBUTION CONTROL FOR AUTOMATIC ICE CUBE MAKER

Harold Herman Esser, Chicago, and Ralph Brent Olson, Lombard, both of Ill., assignors to Schneider Metal Manufacturing Co., Chicago, Ill.

Filed Sept. 14, 1970, Ser. No. 71,869
Int. Cl. F25c *1/12*
U.S. Cl. 62—347 7 Claims



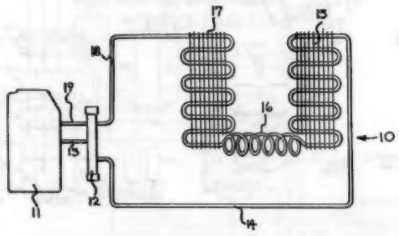
In an automatic ice cube maker of the type in which water flows on the underside of a refrigerated plate to form ice thereon, interceptor means or baffle means interposed between the water supply means and a spatial zone below the refrigerated plate to prevent water loss from the water circulation system and to prevent water contamination of ice through discharge of water from the water supply means to the spatial zone below the refrigerated plate.

3,722,228

CONTROL OF REFRIGERANT MIGRATION TO COMPRESSOR DURING SHUTDOWN

Russell T. Smith, Innisbrook Apts. 3A, Mill Road, Adrian, Mich.

Continuation-in-part of Ser. No. 112,942, Feb. 5, 1971, abandoned. This application Oct. 12, 1971, Ser. No. 188,132
Int. Cl. F25b *41/00*
U.S. Cl. 62—206 10 Claims



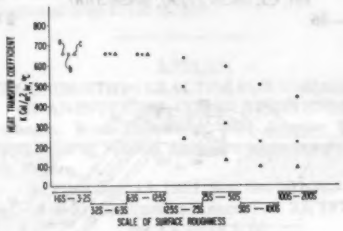
A control of refrigerant migration to the compressor during shutdown in a vapor compressor refrigeration cycle in which a compressor forces the vaporized refrigerant to a condenser from which it passes through an expansion device to an evaporator and then returns to the compressor. The control is such that the head pressure from the compressor opens the passage to the condenser and when the compressor is shut down, such passage automatically closes. Both the inlet to the compressor and outlet from it are automatically opened and closed. Thus, during the shutdown interval the vaporous refrigerant cannot migrate to the compressor.

3,722,229

SMOOTH SURFACE CHILLER CRYSTALLIZER

Ikuta Kayahara, and Yusuke Tanaka, both of Osaka, Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Dec. 29, 1971, Ser. No. 213,614
Claims priority, application Japan, Dec. 29, 1970, 45/120791
Int. Cl. F28f *13/00, 17/00*
U.S. Cl. 62—354 6 Claims



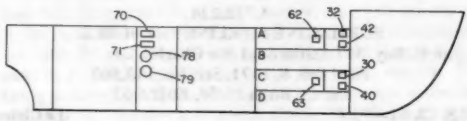
A chiller equipped with a scraper for crystallizing and separating p-xylene in a mixture of C_8 aromatic hydrocarbons including p-xylene by indirect cooling, in which the scraped surface exhibits a surface roughness of less than 12.5-S as indicated in the Japanese Industrial Standard (JIS) B 0601-1970, is disclosed.

3,722,230

SHIP REFRIGERATION

James Scott, Atkinson, N.H., and John S. McDowell, Jr., Flushing, N.Y., assignors to United Brands Company, Boston, Mass.

Filed Dec. 10, 1970, Ser. No. 96,882
Int. Cl. B63b *25/26*
U.S. Cl. 62—200 2 Claims



A ship refrigeration system permits evaporators in different ship cargo compartments being held at different refrigeration temperatures though the respective evaporators are fed refrigerant from a common source, and control means accessible at a common control center are used for modulating the refrigerant pressures in the evaporators in separate compartments of the ship independently depending upon the cooling load demands in the separate compartments.

3,722,231

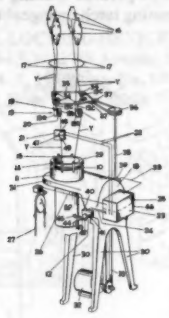
METHOD AND MEANS FOR CIRCULAR KNITTING

Albert Edward Cooke, Leicester, England, assignor to Triplite Limited, Leicester, England

Filed March 9, 1970, Ser. No. 17,789
Claims priority, application Great Britain, March 13, 1969, 13,166/69
Int. Cl. D04b *15/48*
U.S. Cl. 66—132 6 Claims

A method and means are provided for controlling the operation of a circular knitting machine having a plurality of feeding stations with yarn positively fed to the needles at one at least of said stations, wherein the tension is a positively fed length of yarn extending to the feeding point from the positive feeding means at one of the feeding stations is maintained constant by adjusting the needle cylinder axially to adjust the

stitch size at each station under control of a sensing device acting on said length of yarn, so as to compensate for any



changes in tension from a normal value in the said positively fed length of yarn.

3,722,232

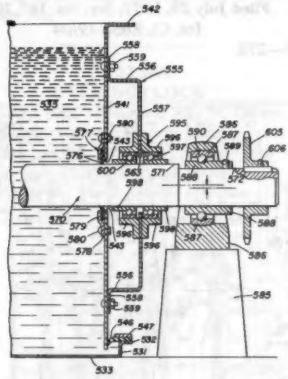
CONTINUOUS WASHING APPARATUS

Erwin B. Bahnsen, Hinsdale, Ill., assignor to Steiner American Corporation, Salt Lake City, Utah

Division of Ser. No. 879,764, Nov. 25, 1969, Pat. No. 3,698,214. Filed Sept. 28, 1971, Ser. No. 184,574

Int. Cl. B05c *B05c*

U.S. Cl. 68—3 SS **4 Claims**



A plurality of cloth articles are transported through a washing apparatus on a conveyor supported by a plurality of shafts extending through movable side walls of the washing apparatus and supported on bearings outside of the washing apparatus to prevent contact of the wash solution with the bearings supporting the shafts, orbital movement of the movable walls imparts similar orbital movement to the conveyor supported by the shafts to impart cycloidal movemet to the clth articles transported by the conveyor.

3,722,233

PROCESS AND APPARATUS FOR CONTINUOUSLY REFINING RUNNING LENGTHS OF MATERIALS

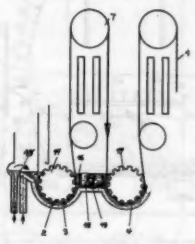
Christian August Meier Windhorst, Hamburg, Germany, assignor to Artos Dr.-Ing. Meier-Windhorst Kommanditgesellschaft, Hamburg, Germany

Division of Ser. No. 802,314, Jan. 31, 1969. This application Oct. 22, 1970, Ser. No. 83,182

Int. Cl. B05c *9/14*

U.S. Cl. 68—5 D **1 Claim**

An apparatus for the continuous refining, preferably dyeing, of wide guided lengths of materials, is used in hot treating liquids on textiles, such as woven and knitted fabrics, tufted fabrics, fibrous fleeces, joined yarns, teasel bands and the like. The apparatus is particularly characterized in that a treating liquid is heated separately from the material being treated at least to the boiling temperature in the case of aqueous solu-



tions. The liquid is guided in the same direction as the material with adjustable amount of flow. There is a low ratio of the weight of the liquid flowing per time unit to the material or there is the smallest possible charge of the liquid simultaneously taking part in the treatment.

3,722,234

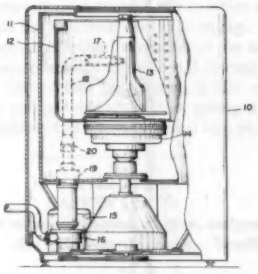
POWER RINSE CLOTHES WASHERS

Peyton W. Douglas, Bemus Point, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed Dec. 24, 1968, Ser. No. 786,682

Int. Cl. D06f *39/08*

U.S. Cl. 68—23.5 **3 Claims**



A clothes washing machine having an outer tub, an inner rotatable tub concentric therewith, a reciprocable agitator and means for selectively driving the agitator and inner tub is provided with means introducing water into the area between the inner tub and outer tub, preferably tangentially against the inner tub in its direction of rotation, at the time the inner tub begins its rotation.

3,722,235

METHOD AND APPARATUS FOR DYING TEXTILES

George S. McGee, Jr., c/o Alloy Fabrications, Inc., P. O. Box 2538, Chattanooga, Tenn.

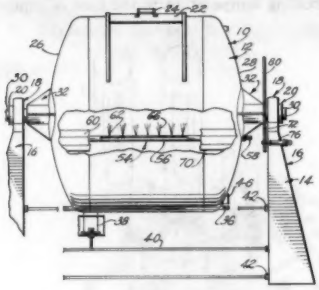
Filed Jan. 7, 1971, Ser. No. 104,553

Int. Cl. D06f *17/12*

U.S. Cl. 68—183 **3 Claims**

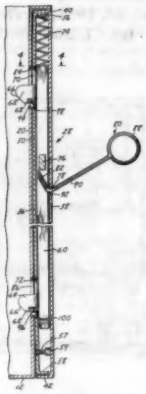
A method of dying textiles such as hosiery, socks, rugs, tubular knit goods or the like, submerged in a tank of dye liquor which is agitated by means of air pressure from orifices beneath the surface of the dye liquor. A conventional dying tub mounted for partial rotation on a stand is filled to its uppermost level with the dye liquor. An airline inside the tank is a hollow pipe or pipes extending through the tank below the central axis thereof and has a plurality of spaced air orifices therein from which air emits under pressure controls from an

air supply line outside the tube which is connected to the air-line inside the tub. The dye liquor level can be increased



because the conventional paddle wheel has been eliminated and the capacity has thereby been increased.

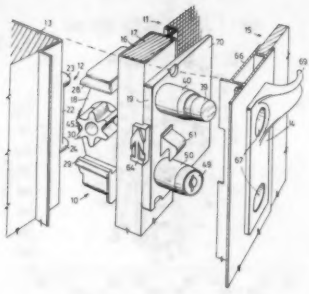
3,722,236
LOCK ASSEMBLY FOR LITTER BINS
Harry Zelenko, 150 East 61st St., New York, N.Y.
Filed Nov. 16, 1971, Ser. No. 199,289
Int. Cl. E05b *65/52, 35/00*
U.S. Cl. 70—78 **7 Claims**



A litter bin having a hinged door is provided with a lock assembly comprising a bar mounted for vertical sliding movement along an inner surface of the door and having a pair of vertically-spaced latch members which extend through corresponding slots on a confronting wall portion of the litter bin. A spring biases the bar downwardly to a locking position in which the latch members overlap said wall portion and prevent the door from being opened. A small circular keyhole is located in the door and is spaced beneath a release pin which projects from the bar. The lock may be opened by a key having a shank formed with an angular terminal portion which is sized to be inserted through the keyhole, and is sufficiently long to engage and raise the release pin when the shank of the inserted key is turned downwardly.

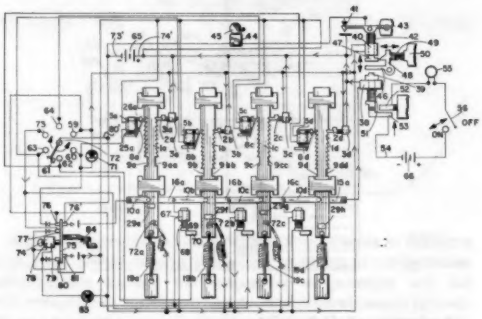
3,722,237
LOCKS
Alfred Charles Taylor, Brisbane, Australia, assignor to Meyers Taylor Pty. Ltd., Virginia, Brisbane, Queensland, Australia
Filed April 27, 1971, Ser. No. 137,932
Int. Cl. E05b *65/04*
U.S. Cl. 70—107 **4 Claims**

A lock for double doors, normally hinged about a common axis, includes an outer door attachment and an inner door locking assembly engageable with a lock strike at the doorway, and having inside and outside release means, and also inside and outside key-operated locking mechanisms. This assembly also has a mating latch engageable with the other door



attachment to hold the doors adjacent, its release covered when the inner door is closed. The outer door attachment is so apertured that when the doors are adjacent, the outside release means and key-operated mechanisms are accessible from outside the outer door.

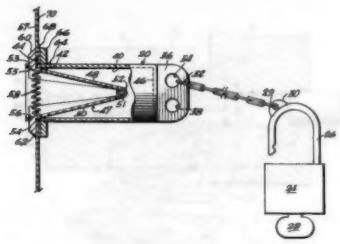
3,722,238
REMOTELY OPERATED ELECTRICAL COMBINATION LOCK
Albert W. Ring, 158-46 96th St., Howard Beach, N.Y.
Filed July 29, 1971, Ser. No. 167,209
Int. Cl. E05b *49/04*
U.S. Cl. 70—278 **18 Claims**



An electrical combination lock in which the lock is in a preferred embodiment a door latch, safe lock, or a switch for actuating a motor, or the like, having a plurality of separate combination switches each switch of which requires a predetermined number of actuations in order to activate the respective switch, each succeeding switch being connected to reset itself and all preceding switches and concurrently to set off an alarm if the actuation member is actuated prior to the closing of all preceding ones of the combination switches, as well as there being a separate actuation member for resetting all of said switches, substantially all combination switches each including a means to reset and to actuate an alarm whenever the predetermined number of actuations for the respective switch is exceeded by a predetermined degree, once actuated the alarm remaining actuated until reset by the opening of the lock by correctly dialing the total combination of the several switches, and a separate actuation switch for opening the circuit connecting the first combination switch actuation means with the alarm circuit and for simultaneously closing the activation circuits of the plurality of combination switches, and for concurrently opening the circuit between the actua-

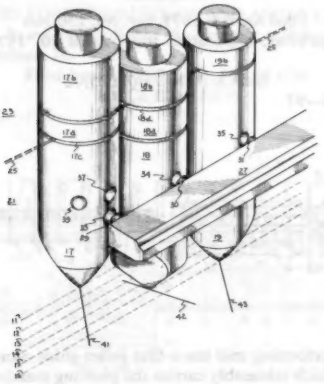
tion means for the first combination switch and the actuation means for the separately actuatable reset.

3,722,239
STEERING WHEEL LOCKING DEVICE FOR VEHICLES
Francisco Mestre, 1834 S.W. 27th Avenue, Miami, Fla.
Filed Oct. 7, 1971, Ser. No. 187,443
Int. Cl. B60r *25/02*; **E05b** *73/00*
U.S. Cl. 70—212 **6 Claims**



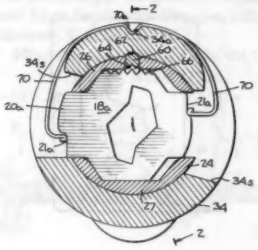
A device for preventing full steering manipulation of the steering wheel of an automobile comprising, a padlock for locking engagement around either the ring or spoke portion of the steering wheel and a chain connecting between the padlock and a tubular member which is adapted to be received through a hole in the dashboard and latched therein in a manner so as to prevent removal thereof from the outer side of the dashboard.

3,722,240
CYLINDER LOCK
Roy C. Spain, P.O. Box 1668, and Roy N. Oliver, 148 Ellen Dr., both of Salem, Va.
Filed Jan. 25, 1971, Ser. No. 109,395
Int. Cl. E05b *15/14, 27/04*
U.S. Cl. 70—364 A **3 Claims**



A cylinder lock having tumblers movable within a key plug in response to the insertion of a bitted key whereby the tumblers both translate and rotate to present discretely located operating elements, or cavities, to cooperating elements, or projections, carried by a fence normally retaining the key plug from rotation in its cylinder shell to release the fence and permit the plug to be rotated; i.e., the projections of the fence normally bearing against the surfaces of the tumblers out of registration with the aforesaid discretely located elements until matching cavities are engaged to bring about release of the fence.

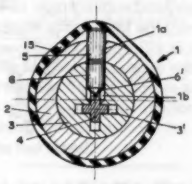
3,722,241
SECURITY CYLINDER LOCK
Stan J. Sussina, Larchmont, N.Y., assignor to Liquidonics Industries, Inc., Plainview, N.Y.
Filed March 3, 1971, Ser. No. 120,529
Int. Cl. E05b *29/02*
U.S. Cl. 70—364 R **5 Claims**



A longitudinal side bar is employed in connection with a standard type of cylinder lock having wafer tumblers with ears that extend through a opening in the rotatable cylinder into the cylinder housing. In order to open the lock, the tumbler ears must be retracted into the cylinder. The longitudinal side bar is held in a longitudinal groove in the rotatable cylinder. When the cylinder rotates, the side bar cams radially inward to engage the tumblers. When the lock is being comprised and torque is applied to the cylinder, the cylinder rotates a predetermined amount even though the tumbler ears are not retracted. The side bar will then ride in to engage the edges of the tumblers to prevent further retraction of the tumbler ears. In this fashion, compromise of the lock is defeated.

A sheet metal curved leaf type spring is also employed to grip the tumblers and provide a constant spring force tending to prevent the tumblers from being aligned by a pick.

3,722,242
SAFETY LOCK
Paul Lipschutz, Croissy-sur-Siene, France, assignor to Societe d'Exploitation des Brevets Neiman, Neuilly-sur-Seine, France
Filed June 14, 1971, Ser. No. 152,798
Int. Cl. E05b *15/00*
U.S. Cl. 70—364 A **6 Claims**

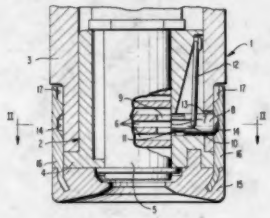


A key-operated, releasable safety-lock of the pin tumbler cylinder type wherein the pin tumblers may project outwards from radial bores accommodating same in the stationary cylindrical outer casing, said pin tumblers being urged inwards by an outer pin-biasing, elastic sleeve tightly enclosing said casing and covering said radial bores and pin tumblers.

3,722,243
STEERING LOCK FOR MOTOR VEHICLES

Gerhard Schiesterl, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Nov. 1, 1971, Ser. No. 194,235
Claims priority, application Germany, Nov. 2, 1970, P 20 53 775.1
Int. Cl. E05b *15/16, 29/02*
U.S. Cl. 70—369 12 Claims

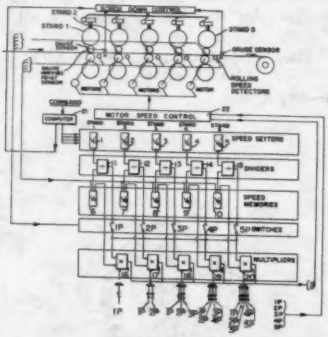


A steering lock for motor vehicles consisting essentially of a steering lock housing, a lock cylinder, a rotor with plate tumblers, a cover cap with a cylindrical extension and a locking pin forced outwardly by a spring and extending through the steering lock housing, which engages in a groove provided in the extension of the cover cap; this extension is thereby made from a material of high strength and an immersion aperture is provided at the end face of at least one plate tumbler, into which the locking pin can be inserted in such a manner that it also simultaneously overlaps over at least one plate tumbler.

3,722,244
METHOD OF CONTROLLING CONTINUOUS ROLLING OF METAL STRIPS

Seiji Fujii; Hiroshi Kuwamoto; Masayuki Ishida, Fukuyama, and Masamoto Kamata, Kawasaki, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Feb. 26, 1971, Ser. No. 119,117
Claims priority, application Japan, March 7, 1970, 45/19211
Int. Cl. B21b *37/00*
U.S. Cl. 72—16 10 Claims

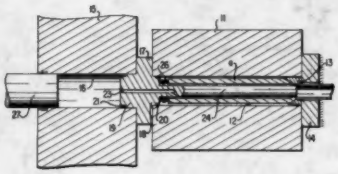


In the continuous rolling of a metal strip by means of a plurality of tandem mill stands, the gauge of the strip is varied by varying the rolling speed of a particular mill stand and of succeeding and or preceding mill stands by the same increment when a gauge varying point of the strip reaches the particular mill stand, and then the rolling speeds of the succeeding and/or preceding mill stands are successively varied by the same increment, thereby finally varying the rolling speed of all stands to the speeds required to produce a strip of a given gauge.

3,722,245
HYDROSTATICALLY OPERATED EXTRUDING MACHINE

Shunji Yamamoto, Nada-ku, Kobe; Tatsu Fujita, Tarumi-ku, Kobe, and Yoshihiro Yamaguchi, Okubocho, Akashi, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed May 10, 1971, Ser. No. 141,663
Int. Cl. B21c *23/08*
U.S. Cl. 72—60 7 Claims

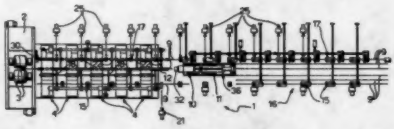


In a hydrostatically operating extruding machine which has a billet container having a cylindrical hollow, a die removably inserted in one end thereof, a die support suitably installed for bearing the die, a hydrostatic pressure generator associated with the billet container having a cylindrical hollow and a ram slidably inserted from a remote end thereof, the improvement comprising connecting means coaxially and sealingly securing the end of the hollow of the billet container opposite the die and the end of the hollow of the generator opposite the ram and having a hollow, a mandrel coaxially secured to the connecting means and extending through the hollow of the billet container and fluidly communicating with both the pressure generator and the billet container.

3,722,246
HOT PERFORATING MILL

Teresio Passoni, Milan, Italy, assignor to Innocenti Societa Generale Per L'Industria Mettallurgica E Meccanica, Milan, Italy

Filed April 1, 1971, Ser. No. 130,366
Claims priority, application Italy, April 10, 1970, 68210 A/70
Int. Cl. B21b *25/02, 25/06*
U.S. Cl. 72—97 5 Claims



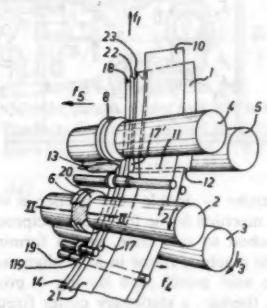
A hot perforating mill has a first roller guide alongside the carriage which releasably carries the piercing mandrel. A first lifting arm raises the mandrel off the first guide and holds it in position for the carriage to engage when the carriage is moved from its rearward to its forward position. When a tubular bloom has been formed and the carriage moves the mandrel, surrounded by the bloom, clear of the mill rollers, a second lifting arm moves the bloom and mandrel transversely on to a second roller guide. Here the bloom is extracted from the mandrel while the mandrel is held against movement. The bloom and mandrel travel separately down the second guide, the mandrel being transferred on to a bench behind the carriage for cooling and storage before being placed on the first guide for re-use.

3,722,247

CORRUGATION OF THIN SHEET

Georges Rouyer, Paris, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed April 5, 1971, Ser. No. 131,048
Claims priority, application France, April 8, 1970, 7012767
Int. Cl. B21d *15/04*
U.S. Cl. 72—106 3 Claims



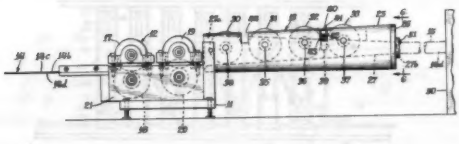
A machine for corrugating thin sheet metal comprising two rolls at a first work station, at least two rolls at a second work station, tracking lateral rollers, a corrugation-forming rake mounted on each roll, at least one clamping roll upstream of one work station, a shell of sheet metal being rotatable between the two rakes of each work station, each work station effecting through the pressure of the first-rake roller a bending of the metal to form a half-profile of the corrugation of each successive helix turn, the successive turns screwing helix-fashion into the rakes whereby to obtain a corrugated shell.

3,722,248

TUBE FORMING METHOD AND APPARATUS

Walter R. Brunken, Medinah, Ill., assignor to Scientific Tube, Inc., Addison, Ill.

Filed June 17, 1970, Ser. No. 46,876
Int. Cl. B21d *5/08*
U.S. Cl. 72—176 10 Claims



A flat strip of metal moving lengthwise first has its edges turned up by roll-forming. Thereafter it moves into the large end of a horn and along one side of the horn so that that side gradually imposes an increasing curvature on the metal and at the exit end of the horn the metal is substantially cylindrical. A non-galling surface is used on the contact face of the horn. A pin between the edges of the sheet at the exit end of the horn orients the cylindrical tube.

3,722,249

DEVICE FOR ROLLING CORRUGATED TUBULAR PARTS

Evgeny Alexandrovich Zhukevich-Stosha, prospekt Mira, 43, kv. 5; Vadim Anatolievich Verderevsky, Volgogradsky prospekt, 171, kv. 35; Genrikh Moiseevich Cherednichenko, ulitsa Mikhailova, 29, korpus 3, kv. 88; Fedor Nikolaevich Dobychin, ulitsa pavla Andreeva, 28, kv. 168; Rafail Moiseevich Lakernik, 11 Parkovaya ulitsa, 44, kv. 100; Felix Grigorievich Svidovsky, Novogireevo, Sojuzny prospekt, 18, kv. 180, and Aron Isaakovich Shapiro, ulitsa Zorge, 16, kv. 86, all of Moscow, U.S.S.R.

Filed Dec. 3, 1970, Ser. No. 94,745
Int. Cl. B21d *15/06*
U.S. Cl. 72—187 3 Claims

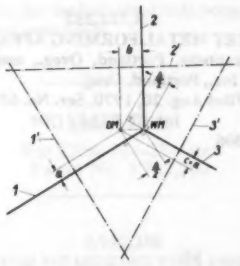
A device for rolling corrugated tubular parts, in which there is provided a row of series arranged passes formed by toothed rolls with at least the first of the passes in the direction of rolling being effected with driven toothed rolls.

3,722,250

ROLLING MILLS AND METHODS

Werner Demny, Dusseldrof, Germany, assignor to Friedrich Kocks

Filed May 20, 1971, Ser. No. 145,220
Int. Cl. B21b *13/10*
U.S. Cl. 72—224 11 Claims



A multi-roller stand, e.g. three roller, for a rolling line in a rolling mill, e.g. a rod mill, has journalled therein rollers of slightly different diameter. When the rollers become worn the worn larger roller can be refinished and used in the same stand as a replacement for the worn smaller roller. The latter can then be refinished or reground and can replace a still smaller worn roller in the same stand or in another stand, in the latter case as a replacement for a larger roller in said other stand. Alternatively the worn larger roller, after refinishing or reprofiling can be moved to a similar position in another stand higher up the line. In this case a worn larger roller from the first stand can, after refinishing or reprofiling, be used to replace a smaller roller in the last stand.

3,722,251

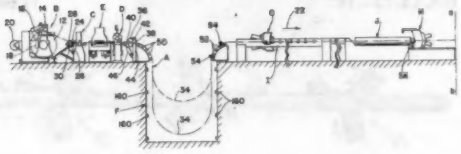
APPARATUS AND METHOD FOR LEVELING METAL STRIP

David A. Withrow, Willoughby, Ohio, assignor to Production Machinery Corporation, Mentor, Ohio

Filed Dec. 17, 1971, Ser. No. 209,249
Int. Cl. B21d *43/28*; B21c *37/02*
U.S. Cl. 72—294 15 Claims

Apparatus for leveling metal strip having a predetermined width includes gripping means for intermittently and succes-

sively gripping predetermined length portions of the strip at longitudinally-spaced locations. The strip is stretched between the longitudinally-spaced locations to produce a stretched strip portion having a width intermediate the spaced locations which is less than the predetermined width. Trimming means acts longitudinally of the strip to trim side portions thereof in order to reduce the predetermined width, at least at the spaced locations, to, or slightly less than, the poststretched width. The strip is continuously fed to a first looping means and continuously pulled from a second looping means. The



gripping means is positioned between the first and second looping means. During a stretching operation, the size of the loop in the first looping means increases and the size of the loop in the second looping means decreases. Transfer means transfers a stretched portion of strip to the second looping means subsequent to a stretching operation. During the transfer step, the size of the loop in the first looping means decreases and the size of the loop in the second looping means increases. The trimming means is spaced from the second looping means in the direction of movement of the strip.

3,722,252

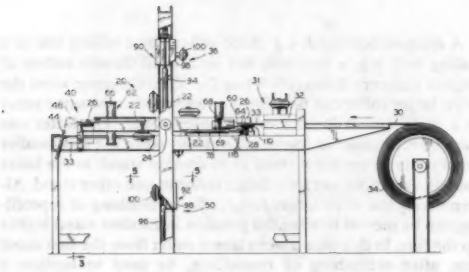
SHEET METAL FORMING APPARATUS

Louis E. Marantette, Portland, Oreg., assignor to General Metalcraft, Inc., Portland, Oreg.

Filed Aug. 20, 1970, Ser. No. 65,436

Int. Cl. B21d *11/04*

U.S. Cl. 72—306 **13 Claims**



A sheet metal blank is fed from a cutter to a clamp of a turret mechanism and is stepped from station to station, where forked twisters form loose tucks in portions of the blank, flatteners press the tucks to tight folds to form well defined corners, and a frustum, which is formed in another portion of the blank as the corners are formed, is bent to a tilted position relative to the portion of the blank in which the corners are formed.

3,722,253

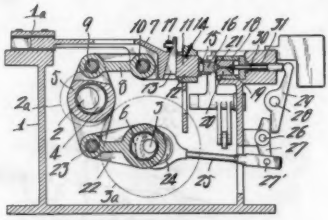
DOUBLE STROKE-DOUBLE BLOW HEADER

Hisashi Tsuda, and Masahiro Oyamada, both of Aida Engineering Kabushiki Kaisha, Sagamihara-shi, Japan

Filed Dec. 22, 1970, Ser. No. 100,722

Int. Cl. B21d *28/00, 45/00*

U.S. Cl. 72—338 **2 Claims**



A double stroke — double blow header in which a slide is mounted in a machine frame for linear reciprocal movement, a punch attached to said slide, and a forming die fixedly secured to said machine frame in axial alignment with and in opposition to said punch and having a product ejecting knockout pin therein, a stationary cutter fixedly secured to said machine frame in parallel to and spaced from one side of said forming die and having an opening through which wire material is to be fed, a movable cutter having an opening for receiving a portion of said material and also for loosely receiving a pin therein and reciprocally movable between said stationary cutter and said forming die, a drive shaft rotatably supported in said frame and having an integral eccentric sheave thereon, a rockable slide drive lever fitted on said eccentric sheave and having one end connected to said slide through a linkage for driving the slide, a follower shaft rotatably supported in said frame to be driven by said drive shaft with a rotational speed ratio of 2:1 with respect to the drive shaft and having two integral eccentric sheaves thereon, a control level fitted on one of said eccentric sheaves on the follow shaft and pivotally connected to the other end of said slide drive lever, and an operation bar fitted on the other eccentric sheave on said follower shaft for actuating said knockout pin to eject a formed project out of said forming die.

3,722,254

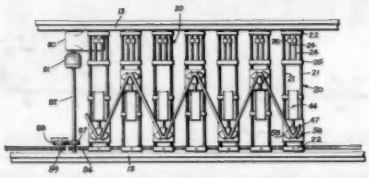
MATERIAL FORMING APPARATUS

Michael Katogir, 41 Beverly Rd., N.E., Atlanta, Ga.

Filed Nov. 17, 1970, Ser. No. 90,318

Int. Cl. B21d *11/07*

U.S. Cl. 72—383 **19 Claims**



This invention relates to a material forming method and apparatus for use in forming a series of predetermined shaped configurations in a length of material. More particularly, this invention includes a series of material forming heads. Each of the material forming heads includes complementary material bending means for forming a predetermined shape in a length of material. The series of material forming heads are supported on the material forming apparatus in a position to receive a length of material to be formed. Control means is

operatively associated with the material forming heads for effecting a material forming operation. The control means includes automatic means for stopping the forming operation after the material has been formed to a predetermined shape. The control means is selectively setable whereby the shape of the material can be adjusted to a desired set position. The series of material forming heads are supported on the material forming apparatus and operatively associated with each other whereby the heads are moveable relative to each other in response to the material being formed to a predetermined shaped configuration. The material bending means includes spaced material contacting and guide means detailed to prevent damage to the length of material during a forming operation.

3,722,255

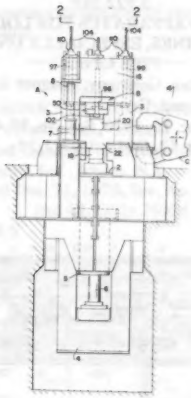
ROTATABLE PRESS DIE

Elwood Allen Martin, Salem, Ohio, assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed Sept. 8, 1971, Ser. No. 178,592

Int. Cl. B21j *13/02*

U.S. Cl. 72—447 **17 Claims**



A top die on a forging press is rotatable about a vertical axis to facilitate die replacement and to position the die for use as a straightening tool.

3,722,256

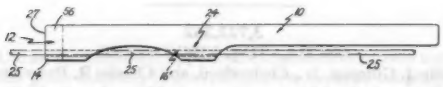
WIRE BENDING TOOL

Michael Iascone, 79 Third St., Medford, Mass.

Filed April 1, 1971, Ser. No. 130,114

Int. Cl. B21d *37/14*

U.S. Cl. 72—470 **10 Claims**



A hand tool is adapted for bending wire manually and includes an elongate bar having a wire engaging head secured thereto at one end and another, similar, wire engaging head disposed intermediate the ends of the bar. Two such identical tools are employed to effect the desired bend in the wire. Each head on each tool projects transversely from the bar and has a T-shaped channel which extends parallel to the axis of the bar. In use the tools are placed, head end to head end, parallel to the wire, with the wire received in the T-shaped slots. With the adjacent head ends of the tools in abutment, the distal ends of the tools then are pivoted transversely toward each other to effect the desired bend in the wire at a location between the proximate ends of the tools. During bending, the proximate ends of the tools bear against each other to provide leverage.

3,722,257

INCREMENTAL CONSTRUCTION OF THREE-DIMENSIONAL OBJECTS HAVING PREMACHINED ROD ELEMENTS AND METHOD FOR FORMING THE SAME

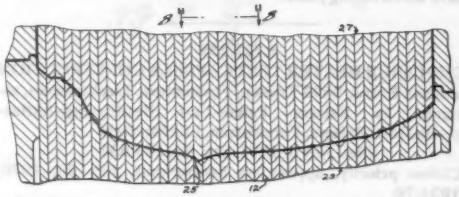
Harold N. Bogart, Farmington; Norman W. Hopwood, Jr., Dearborn, both of Mich.; Archie A. Pearson, Tryon, N.C., and Foster E. Whitacre, Farmington, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 749,685, Aug. 2, 1968, Pat. No. 3,605,528.

This application Nov. 5, 1970, Ser. No. 87,198

Int. Cl. B21d *37/14;* **B21k** *5/20*

U.S. Cl. 72—475 **3 Claims**



A three-dimensional article and a method of manufacturing it, said article comprising individual increments in the form of rods that are premachined or preformed and assembled in registry, said rods being precut to discrete lengths, one end of each rod forming an increment of a precalibrated surface contour, each incremental surface being located in an optimum plane tangent to the precalibrated surface, the rod lengths and the cutting angles for the individual rods being determined by numerical control techniques.

ERRATUM

For Class 72—294 see:
Patent No. 3,722,280

3,722,258

SYSTEM FOR MEASURING TIME DIFFERENCE BETWEEN AND SYNCHRONIZING PRECISION CLOCKS

Jean R. Besson, 1, rue du Moulin de Pierre, Issy-les-Moulineaux, and Jean R. Boillot, 145, rue de Chalais, L'Hay-les-Roses, both of France

Filed March 9, 1972, Ser. No. 233,078

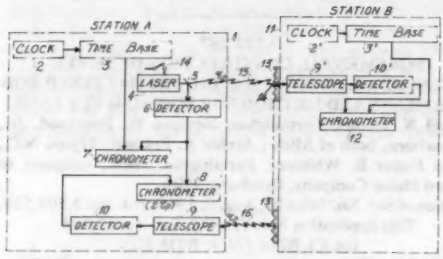
Claims priority, application France, March 12, 1971, 7108710

Int. Cl. G04b *17/00*

U.S. Cl. 73—6 **2 Claims**

System for measuring the time difference between a master precision clock and a slave precision clock situated respectively in a master and a slave station remote from each other. The clocks generate timing pulses with respective frequencies very close to each other. The master station includes a laser source of light pulses generating luminous pulse signals, a local detector of these signals and means for transmitting them towards the slave station. The slave station includes a detector of the luminous pulse signals and means for reflecting the same towards said master station. Two chronometers in the master station measure the time difference between the instant of generation of a luminous pulse signal and a master clock timing pulse and the time difference between the instant of generation of a luminous pulse signal and the instant of de-

tection of a reflected back luminous pulse signal and a third chronometer in the slave station measures the time difference



between the instant of detection of a luminous pulse signal and a slave clock timing pulse.

3,722,259

RESISTANCE HEATER TEST CAPSULE CONSTRUCTION

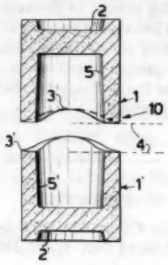
Thaddaus Kraus, 9495 Triesen, Furstentum, Liechtenstein, assignor to Balzers Patent-Und Beteiligungs-Aktiengesellschaft, Balzers, Furstentum, Liechtenstein

Filed July 6, 1971, Ser. No. 159,836

Claims priority, application Switzerland, July 20, 1970, 011024/70

Int. Cl. G01n *25/14;* **F27d** *11/02*

U.S. Cl. 73—19 **4 Claims**



A test capsule made of graphite which can be clamped between current supply electrodes and heated by current passage therethrough includes interengageable container-forming portions which, when fitted together, form a closed cylindrical capsule. The two parts are made of substantially identical size and configuration and they have corrugated or wavy-form side edges which interengage and interlock without a joint upon closing.

3,722,260

METHOD AND APPARATUS FOR DETECTING WEIGHT VARIATIONS OF A SLIVER ON SPINNING PREPARATORY MACHINES

Paul Staheli, Wilen bei Wil/Thaurgau, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

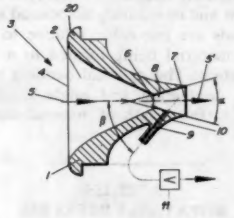
Filed March 5, 1971, Ser. No. 121,333

Claims priority, application Switzerland, March 11, 1970, 3582/70

Int. Cl. D01h *5/32;* **G01b** *13/04, 13/08*

U.S. Cl. 73—37.7 **11 Claims**

A method and apparatus for detecting weight variations of a sliver on spinning preparatory machines, such as cards, draw frames and similar machines, at which the sliver passes through the channel or duct of a sliver funnel or trumpet. According to the invention, the sliver is initially condensed in the sliver funnel duct in order to expel entrained air. Immediately thereafter the sliver is again expanded and by virtue of such expansion there is produced at the expansion zone a pneumatic vacuum which is proportional to the weight variations of



the throughpassing sliver. This generated vacuum is then advantageously employed to control an amplifier for performing a desired operation, namely a measuring or control.

3,722,261

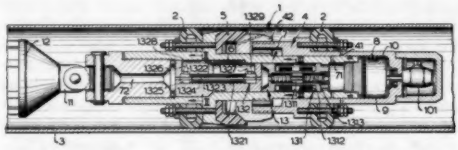
METHOD OF AND APPARATUS FOR LOCATING LEAK AREAS OF PIPE LINES, ESPECIALLY UNDERGROUND PIPE LINES

George Milke, Munster, Germany, assignor to Hoesch Akteingesellschaft, Dorlmund, Germany

Filed Dec. 10, 1970, Ser. No. 97,456

Int. Cl. G01m *3/02, 3/26*

U.S. Cl. 73—40.5 R **19 Claims**



A method and apparatus for locating leaks in conduits, such as pipes, particularly underground pipes. The apparatus comprises a member to be placed in the pipe and is free therein and can be moved from position to position along the pipe by a supply of fluid to the pipe on one side or the other of the member. The member is adapted to be sealed to the pipe and has a flow passage therethrough having flow sensitive measuring instrumentalities therein. The member also, preferably, includes a broadcasting device which broadcasts signals received from the instrumentalities to a remote station wherein the signals can be read.

3,722,262

OSCILLATING VISCOMETER

Philip J. Gilinson, Jr., Chelmsford, and Charles R. Dauwalter, Waban, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

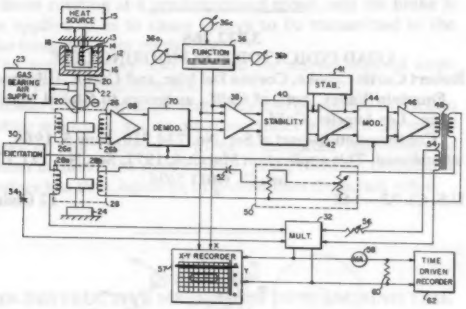
Filed March 16, 1972, Ser. No. 235,279

Int. Cl. G01n *11/16*

U.S. Cl. 73—59 **18 Claims**

For complex rheological studies, a viscometer is employed having a fixed and temperature controlled first element and a rotatable second element with a fluid whose viscous properties are to be measured contained between the two elements. A precision drive circuit is provided for oscillating the second element with respect to the first element at very slow shear rates in accordance with a periodic electrical signal whose waveform is variable. The current required to rotate or stop

the second element is measured against time and angular displacement to provide an indication of fluid viscous properties



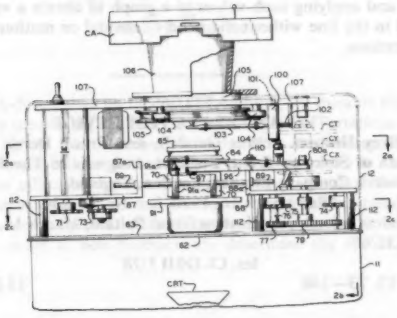
and to permit separate detection of the elastic and viscous responses of the fluid.

3,722,263

ULTRASONIC INSPECTION APPARATUS

Bruno Wendell Hautaniemi, Ithaca; Robert A. Bowman, Ludlowville, and Kenneth R. Bangerter, Ithaca, all of N.Y., assignors to Ithaco, Inc., Ithaca, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,785
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.8 S **25 Claims**



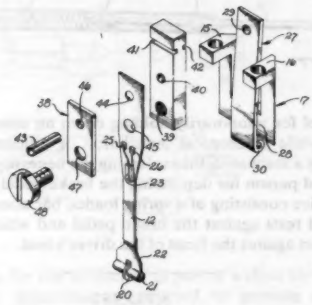
Ultrasonic inspection apparatus includes an improved transducer guide assembly to provide uniform acoustic coupling to an animal. Successive line scan traces made in a fixed position on the face of a cathode ray tube as a transducer moves along a complex path and as reflected sound energy is received are imaged on successive portions of a film which need not be translated relative to the cathode ray tube. A plurality of cams translate a lens mounted in between the cathode ray tube and the film and appropriately rotate the film without translating it. In one alternative embodiment the cathode ray tube image is both translated and rotated electronically, so that no relative motion is required between the cathode ray tube and the film. In several other embodiments, the CRT line trace is relayed using fiber optics or photosensors and light-emitting diodes to provide a remote trace along a rigid rod which is appropriately moved relative to the film.

3,722,264

TRANSDUCER AND COMPONENTS THEREFOR

Robert Eugene Talmo, Pasadena; Donald L. Ham, Arcadia, and Lowell J. Leyrer, Costa Mesa, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 25, 1971, Ser. No. 109,224
Int. Cl. G01l *1/22*; G01b *7/18*
U.S. Cl. 73—88.5 R **8 Claims**



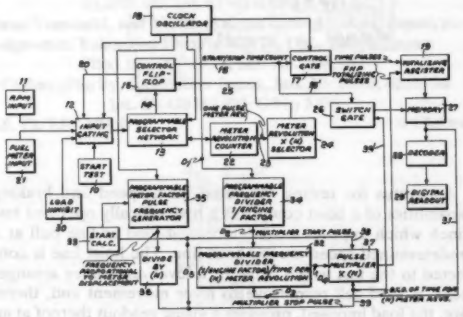
A differential pressure unit having an internal leaf spring cantilever strain gage beam in which the normally fixed end of the beam is adjustable in position throughout a predetermined range.

3,722,265

ENGINE PERFORMANCE COMPUTING ARRANGEMENT

Thomas R. Metz, and Eugene F. Holben, both of Haddonfield, N.J., assignors to Conoflow Corporation, Blenheim, N.J.

Filed March 15, 1971, Ser. No. 124,098
Int. Cl. G01m *15/00*
U.S. Cl. 73—117.3 **26 Claims**



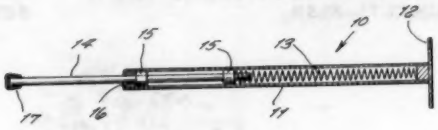
A computing arrangement is described in which the fuel horsepower of an engine under test is calculated and displayed. A programmable network generates a pulse output when a preselected RPM is reached by the engine under test. A control means in response to the output pulse permits time clocking pulses to be applied to a register to sense the time required for a predetermined number of fuel input pulses to be generated. A fuel consumption meter counting means is coupled to sense the predetermined number of fuel input pulses, and a storage means stores the total time required to sense the fuel pulses. A programmed calculating arrangement is coupled to the storage means and programmed for computing the fuel horsepower of the engine and to display in a digital readout the results of the calculation.

3,722,266

BRAKE BLEEDING TOOL

John C. Dunham, 227 Parker St., Cement City, Mich.

Filed Jan. 3, 1972, Ser. No. 214,812
Int. Cl. G05g 21/00
U.S. Cl. 73—132 **1 Claim**



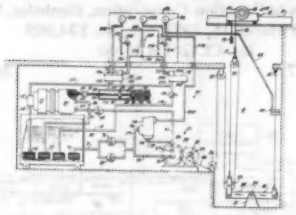
A tool for temporarily holding down an automobile brake pedal while mechanical installation or adjustment is being made by a mechanic, thus releasing the necessity of employing a second person for depressing the brake pedal with the foot; the device consisting of a spring loaded bar assembly which at one end rests against the brake pedal and which at its other end bears against the front of the driver's seat.

3,722,267

HOIST-TESTING APPARATUS AND CONTROL SYSTEM THEREFOR

Richard O. Gordon, Belgium, Wis., assignor to Harnischfeger Corporation, Milwaukee, Wis.

Filed Nov. 3, 1971, Ser. No. 195,114
Int. Cl. G01l 3/00
U.S. Cl. 73—133 R **13 Claims**



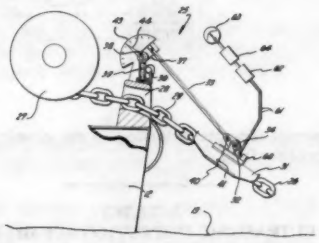
Apparatus for testing the rated load, speed and braking capabilities of a hoist comprises a hydraulically operated test winch which imposes a predetermined load or line pull at a predetermined speed on the hoist line. The hoist line is connected to the test winch cable by a lever and pulley arrangement. A load cell responsive to lever movement and, therefore, the load imposed, provides a visual readout thereof at an operation control station. Load size is remotely adjustable from the control station by a load control rheostat which controls an electric-hydraulic pressure control valve which, in turn, adjusts the pressure relief setting of a pressure relief valve between a hydraulic winch motor and the hydraulic pump for that motor. A load control pressure gauge at the control station is responsive to output pressure of the electric-hydraulic pressure control valve for the pressure relief valve and is calibrated to indicate pounds of line pull or load which the hoist being tested can exert to enable the operator to set the load control rheostat accordingly. Load speed is remotely adjustable from the control station by a speed control rheostat which controls another electric-hydraulic pressure control valve which, in turn, operates a cylinder to adjust the speed setting of a servo-stem speed control device on the pump. A speed control pressure gauge at the control station is responsive to output pressure of the other electric-hydraulic pressure control valve for the speed adjustment cylinder and is calibrated to indicate feet per minute of hoist line speed to enable the operator to set the speed control rheostat accordingly.

3,722,268

LOAD INDICATOR FOR MOORING LINE

Robert Curtis Crooke, Corona Del Mar, and Carl E. Hilsabeck, Fountain Valley, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 734,710, June 5, 1968, abandoned. This application March 4, 1971, Ser. No. 121,176
Int. Cl. G01l 5/04
U.S. Cl. 73—143 **12 Claims**



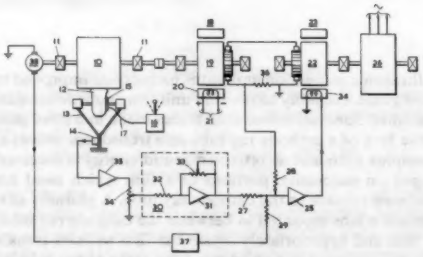
Mooring line load indicating apparatus having a sensing device connected to a mooring line and an associated indicator showing the slope of the line at a chock or the like and from which load in the line may be determined. Alternatively, the indicator may show the mooring line load directly. The invention also provides a method of mooring line load determination, which method includes the steps of determining the water depth, the slope of the mooring line at a chock or the like and applying such values to a graph to obtain a value of load in the line without the need of mental or mathematical operations.

3,722,269

TIRE AND BRAKE TEST DEVICE

Geoffrey Herbert Arthur Gunnell, and Frank Derek Shaw, both of Stoke-on-Trent, England, assignors to The English Electric Company Limited, London, England

Filed March 16, 1970, Ser. No. 19,830
Claims priority, application Great Britain, March 14, 1969, 13,637/69
Int. Cl. G01l 5/28
U.S. Cl. 73—146 **16 Claims**



A machine for testing the performance of tires and brakes has a drum 10 against which presses a tired-wheel 12, the drum being coupled to a D.C. electric machine 18, and the tired wheel having a brake 15 for varying the tractive effort applied by the wheel to the drum. Control apparatus for the

electric machine varies the torque applied to the drum by the electric machine in dependence upon the tractive effort applied to the drum by the brake so that the apparent inertia of the drum and associated mechanical parts is, as desired, smaller than, equal to, or greater than the true inertia according to the setting of the control apparatus. A test starts with the drum rotating at a predetermined speed, and the brake is then applied so as to cause energy to be transmitted to the brake from the drum via the tire.

The machine may also be used for testing internal combustion engines and clutches.

Similar control arrangements may also be applied to friction welding machines, and to other machines in which the stored energy of one member is to be transmitted frictionally to another member, the stored energy being thereby controllable at values less than, equal to, or greater than the actual value.

3,722,270

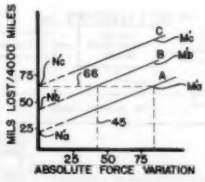
NON-DESTRUCTIVE METHOD OF DETERMINING TIRE LIFE

Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex.

Division of Ser. No. 847,778, July 14, 1969, Pat. No. 3,563,088, which is a continuation of Ser. No. 578,707, Sept. 12, 1966, abandoned, which is a continuation-in-part of Ser. No. 504,727, Oct. 24, 1965, Pat. No. 3,397,583. This application Feb. 12, 1971, Ser. No. 114,997

Int. Cl. G01m *17/02*

U.S. Cl. 73—146 **10 Claims**



A non-destructive method of determining the durable life of a tire by measuring the lateral and radial force variations exhibited by the tire. A series of similar tires are measured for their force variations, and subjected to usage in order to determine the effect of the force variations upon the durable life characteristics of the series. The force variations exhibited by the tire are compared to the data obtained from the series of tires in order to non-destructively determine the life of the tire.

3,722,271

GEOCHEMICAL PROSPECTING IN SUBMERGED AREAS

Leo Horvitz, 8116 Westglen Dr., Houston, Tex.

Filed Nov. 20, 1970, Ser. No. 91,532

Int. Cl. E21b *47/10*

U.S. Cl. 73—170 A **10 Claims**

A method of geochemical prospecting in submerged areas comprising the taking of samples of the water at or close to the bottom at spaced locations in such an area, which samples are then analyzed to determine the concentration therein of leakage products indicative of the presence of subterranean petroliferous deposits and the results of such analyses are correlated with sample location to provide information concerning such deposits. The method also includes the taking of samples of the earth formation beneath the bottom at such sample locations from which the character of the formation and the concentration therein of products indicative of the presence of subterranean petroliferous deposits may be obtained.

3,722,272

CLEAR AIR TURBULENCE DETECTORS

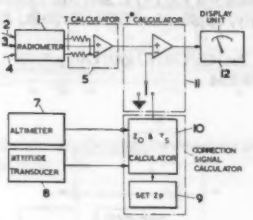
Alasdair McPherson, Keysoe, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed July 9, 1971, Ser. No. 161,177

Claims priority, application Great Britain, July 10, 1970, 33,541/70

Int. Cl. G01c *21/00*

U.S. Cl. 73—178 R **6 Claims**



A radiometer for use in aircraft as part of a clear air turbulence detector apparatus, constructed to provide signals representing the atmospheric temperatures of at least three regions ahead of the aircraft and centered about sight-lines having different angles of elevation or declination with respect to the aircraft, is connected to means for deriving a temperature-difference signal indicating the difference between the measured temperature of a central one of the regions and an average of the measured temperatures of two regions on opposite sides of the central region. The apparatus preferably includes a correction-signal deriving circuit for deriving a correction-signal dependent upon the local tropopause height at the time of flight and the altitude of the regions subject to temperature measurement and a display for indicating when the temperature-difference signal differs significantly from the correction signal.

3,722,273

FLOW MEASURING APPARATUS

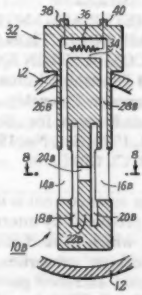
Hiroo Yamasaki, and Yoshio Kurita, both of Tokyo, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Jan. 22, 1971, Ser. No. 108,731

Claims priority, application Japan, Jan. 30, 1970, 45/8196

Int. Cl. G01f *1/00*; **G01p** *5/00*

U.S. Cl. 73—194 B **6 Claims**



Flow metering apparatus comprising an elongate cylindrical element mounted in the stream of flowing fluid to produce Karman's vortices, the element being formed on opposite sides thereof with openings leading into corresponding interior cavities coupled together within the element; pressure conduits connect from each of the interior cavities to a sealed pressure chamber outside of the stream of flowing fluid and

containing a flow-responsive detecting device including an electrically-heated wire adapted to develop electrical pulses corresponding to the pressure pulses produced by the shedding of Karman's vortices.

3,722,274

MAGNETIC FLOW METER

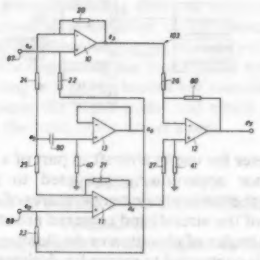
Luc Yves Natens, B 2600 Berchem, and Jean Martha De Gueldre, B 2520 Edegem, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed April 13, 1971, Ser. No. 133,560

Claims priority, application Great Britain, April 14, 1970, 17,752/70

Int. Cl. G01f *1/00*; G01p *5/08*

U.S. Cl. 73—194 EM **5 Claims**



A magnetic flow meter, the pre-amplifier of which comprises two identically connected operational amplifiers having differential inputs, each feeding one of the differential inputs of a third operational amplifier, two identical impedances connected in series between the inverting inputs of the first two operational amplifiers, a fourth operational amplifier connected as a voltage follower the input of which is connected to the node of the said two impedances and the output of which is connected through two pairs of series resistors to the corresponding non-inverting inputs of the two first mentioned operational amplifiers, the nodes of said pairs of series resistors being connected through further resistors to the output of the corresponding operational amplifiers, the input terminals of the pre-amplifier being formed by the said non-inverting inputs of the two first mentioned operational amplifiers and the output of the pre-amplifier being formed by the output of the third operational amplifier.

3,722,275

BLUFF BODY FLOWMETER ARRANGEMENT FOR USE IN CONTROLLING AIR POLLUTION PRODUCED BY INTERNAL COMBUSTION ENGINES

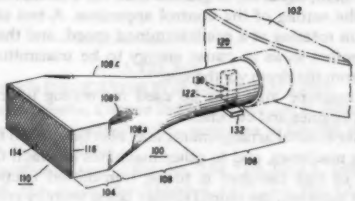
Alan E. Rodely, Fanwood Township., Union County, and Theodore J. Fussell, Bridgewater Township., Somerset County, both of N.J., assignors to Eastech, Inc., South Plainfield, N.J.

Filed Nov. 4, 1971, Ser. No. 195,544

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 B **13 Claims**

A bluff body flowmeter arrangement is described for use in controlling air pollution produced by internal combustion engines. The arrangement, which is used to monitor the air intake of the combustion engine, comprises, in combination, a conduit having an optional entrance portion of a relatively large uniform cross-section, an exit portion of a relatively smaller uniform cross-section coupled to the engine air intake and a transition portion having a tapered cross-section connecting the entrance and exit portions; a bluff body disposed in the exit portion transverse to the air flow; and damping means covering the inlet of the entrance portion for preventing drafts and cross-winds from disturbing the velocity profile of air flow in in the conduit sufficiently to interfere with regular vortex shedding by the bluff body. Also described is an embodiment in which the entrance portion of the conduit is omitted, in which case the damping means covers the inlet of



the transition portion through which air enters and passes to a bluff body located in the exit portion.

3,722,276

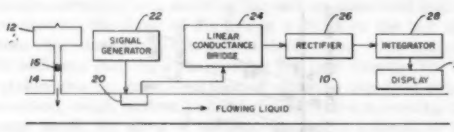
VOLUMETRIC FLOW RATE MEASUREMENT OF A FLOWING STREAM

Ronald W. Chandler, Richardson, and Jack B. Hammond, Carrollton, both of Tex., assignor to Tetradyne Corporation, Dallas, Tex.

Filed Dec. 6, 1971, Ser. No. 204,837

Int. Cl. G01f *1/00*

U.S. Cl. 73—194 E **19 Claims**



The specification discloses a technique for determining the volumetric flow rate of a flowing stream wherein a predetermined quantity of material which will alter the electrical conductivity of the stream is selectively introduced into the stream. A conductance probe is disposed downstream from the point at which the material is deposited in order to continuously detect the electrical conductivity of the stream. An enforced linearity electrical bridge is responsive to the output of the probe for detecting the change in conductance of the stream which is caused by the added material. Integrating circuitry integrates the change in conductance determined by the bridge. A nonlinear meter is responsive to the integrating circuit, along with an indication of the electrolyte equivalents of the deposited material, in order to directly indicate the volumetric flow rate of the stream. Circuitry is provided to prevent the polarization of the conductance probe. A reset circuit enables the integrating circuitry to be set to zero for additional measuring cycles.

3,722,277

TRANSMISSION HAVING DIRECTION CONTROL

Ferol S. Fell, Newton; Lowell J. Goering, Moundridge, and William D. Long, Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

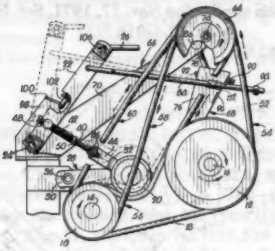
Filed May 11, 1971, Ser. No. 142,135

Int. Cl. F16h *9/00*

U.S. Cl. 74—220 **17 Claims**

A power transmission is provided with a pair of belts interconnecting a drive and a driven sheave in an arrangement which permits selective rotation of the driven sheave in either direction by movement of corresponding idler pulleys alternately from a neutral position to their belt tightening posi-

tions. A lost motion assembly forming a part of an extensible toggle link connection with one of the belt tightening units



makes it possible to use but a single actuator to control the entire operation.

3,722,278
FLOW METER

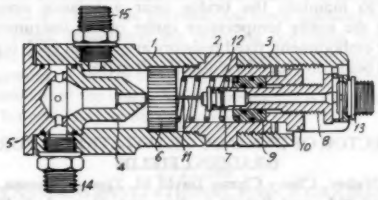
Francis Graham Young, Southampton, and Christopher Guy Scott Wilson, Portsmouth, both of England, assignors to National Research Development Corporation, London, England

Filed Oct. 21, 1970, Ser. No. 82,729

Claims priority, application Great Britain, Oct. 22, 1969, 51,795/69

Int. Cl. G01f *1/00*

U.S. Cl. 73—228 **2 Claims**



A flow of liquid to be monitored is passed longitudinally into a cylinder via a nozzle so as to impinge on a leaky piston within the cylinder. The piston is resiliently urged towards the nozzle and takes up a position dependent on the flow rate, this position being sensed by a displacement transducer.

3,722,279
APPARATUS FOR MEASURING FLUID FLOW

Jan Jablonski, London, England, assignor to Elliott Brothers (London)Limited, London, England

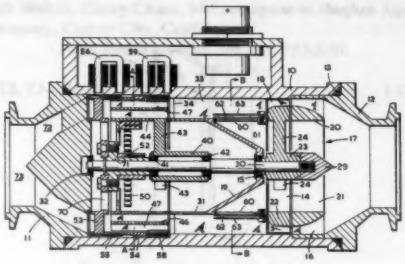
Filed May 11, 1970, Ser. No. 36,154

Claims priority, application Great Britain, July 9, 1969, 34,643/69; May 9, 1969, 23,752/69

Int. Cl. G01f *1/00*

U.S. Cl. 73—231 M **15 Claims**

In apparatus for measuring the mass rate of flow of a fluid by imparting an angular component of velocity to the fluid and measuring the flow rate in arbitrary time units, the angular velocity is imparted to the fluid by an impeller. In this invention the impeller is driven by a turbine which is driven by the fluid the rate of flow of which is to be measured. Valves are also provided so that some of the fluid will automatically bypass the turbine if the rate of fluid flow rises above a predetermined value. This arrangement enables the turbine



speed to be maintained substantially constant over a very wide range of rates of fluid flow.

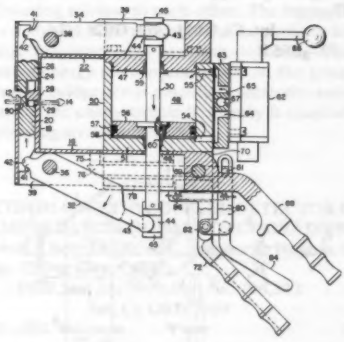
3,722,280
PORTABLE FASTENING TOOL

Theodore A. Van Greuingen, Dana Point, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed March 25, 1971, Ser. No. 127,930

Int. Cl. B21d *43/28, 39/00*

U.S. Cl. 72—294 **9 Claims**



A portable tool for fastening together superposed metal members. The tool has two movable frame portions which are operable to firmly clamp the metal members together. With the metal members firmly clamped, a punch element, movable within one of the frames, is moved to punch integral tabs in the members through die openings provided in the other frame. As the punch is withdrawn the tabs are bent by a bender element movable within the other frame, the bending being sufficient to firmly lock the members together without a complete bending of the tabs back against the surface of the superposed members.

3,722,281
LIQUID HEIGHT GAUGE

Lawrence B. Marsh, Silver Spring, Md., assignor to Engineering Physics Company, Rockville, Md.

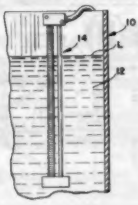
Filed Nov. 4, 1970, Ser. No. 86,676

Int. Cl. G01f *23/22*

U.S. Cl. 73—304 R **14 Claims**

A primary means comprises a coil wrapped around a support member, a secondary means including a coil also wrapped around said support member and adjacent said primary coil. The primary coil is insulated from the liquid and the secondary coil is exposed to the liquid. The secondary means includes a second remote member which is also exposed to the

liquid and a voltage is developed between the first and second secondary members. The primary coil is connected with an a.c. source and induces an alternating voltage in the secondary



coil. An indicating means indicates the voltage developed between the secondary members which is proportional to the level of liquid in contact with the two secondary members.

3,722,282

APPARATUS FOR REMOTELY DISPLAYING TEMPERATURE DIFFERENCES OF AN OBJECT

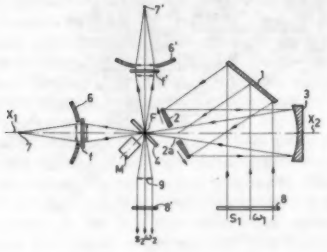
Fernand Rene Loy, Choisy-le-roi, France, assignor to U.S. Philips Corporation, New York, N.Y.

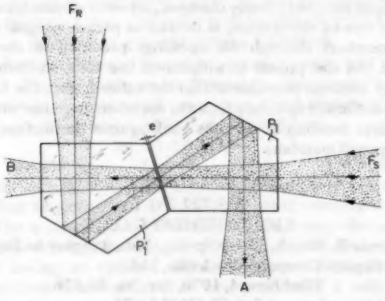
Filed Oct. 22, 1970, Ser. No. 83,104

Claims priority, application France, Sept. 26, 1969, 6932987

Int. Cl. G01j *5/62*; G02f *1/34*

U.S. Cl. 73—355 R **2 Claims**





An analyzing device for displaying temperature differences of an object in which a modulator device is inclined at an angle to the principal axis of the analyzing device and alternately transmits the rays which emanate from a point of the scene to be analyzed and a reference beam which indicates the mean temperature of the said scene.

3,722,283

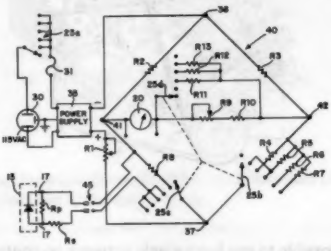
LINEAR READING THERMOMETER

Richard W. Treharne; James A. Riley, and Eddie R. Thomas, Yellow Springs, Ohio, assignors to Kettering Scientific Research Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 29,197, April 16, 1970, abandoned. This application Nov. 17, 1971, Ser. No. 199,479

Int. Cl. G01k *7/22*

U.S. Cl. 73—362 SC **9 Claims**



A silicon diode is used in a bridge circuit designed to provide linear changes in current through a meter in the bridge in response to changes in temperature on the diode. Variations from linear response in individual diode resistance characteristics as a function of temperature are compensated by a resistor in series with the diode and a second resistor in parallel with the diode, with these resistors being selected so that the resistance versus temperature characteristic of the entire circuit is fixed, thereby providing linear response and allowing interchangeability of diode temperature measuring circuits with a single bridge. All legs of the bridge circuit include resistances of the same order of magnitude to provide maximum sensitivity of the bridge to temperature measurements. In one embodiment one leg of the bridge is provided with a plurality of resistors, one of which is connected at a time in the bridge circuit to maintain the bridge near a balance condition through the entire temperature range of the instrument. In another embodiment, fixed resistors are used in each leg with readout being provided by a digital volt meter.

3,722,284

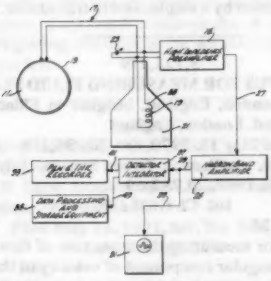
DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENT FIELDS

Joseph Weber, Chevy Chase; David M. Zipoy, Takoma Park, both of Md., and Robert L. Forward, Oxnard, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 399,632, Sept. 28, 1964. This application Feb. 1, 1966, Ser. No. 524,294

Int. Cl. G01m *1/12*

U.S. Cl. 73—382 **8 Claims**



The invention is an instrument for detecting and measuring dynamic gravitational force gradient fields having a characteristic frequency and includes a body of aluminum having dis-

tributed mass including a dynamic mass quadrupole moment responsive to dynamic gravitational force gradients by the excitation of a vibrational resonant mode in the aluminum body. An output is provided by means of at least one electromechanical transducer coupled to the body which, in conjunction with the aforementioned vibrational resonant mode forms an electromechanical circuit which is resonant at a selected frequency corresponding to the characteristic frequency of the dynamic gravitational force gradient.

3,722,285

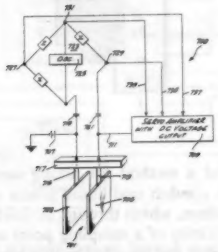
ELECTROSTATIC COUPLED DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENTS

Joseph Weber, Chevy Chase, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 399,682, Sept. 28, 1964. This application Jan. 31, 1969, Ser. No. 795,539

Int. Cl. G01v 7/04

U.S. Cl. 73—382 **1 Claim**



This is a detector wherein a dynamic mass quadrupole arrangement includes two parallel conducting charged plates capable of movement relative to each other. The arrangement is coupled to a dynamic gravitational force gradient having a characteristic frequency, the coupling occurring through a dynamic stress-energy-momentum tensor in the quadrupole arrangement. A bridge-servo amplifier electro-dynamical circuit resonant at the characteristic frequency is coupled to the plates for providing an output signal.

3,722,286

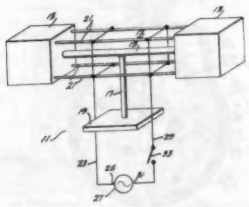
DYNAMIC GRAVITATIONAL FORCE GRADIENT TRANSDUCER

Joseph Weber, Chevy Chase, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 28, 1964, Ser. No. 399,682

Int. Cl. G01v 7/04

U.S. Cl. 73—382 **11 Claims**



This is a dynamic gravitational force gradient transducer wherein a dynamic gravitational force gradient having a characteristic frequency interacts with a dynamic stress-energy-momentum tensor in a dynamic mass quadrupole. There is also provided electrical input-output means coupled to the mass quadrupole to form an electrodynamical circuit which is resonant at the characteristic frequency of the force gradient.

3,722,287

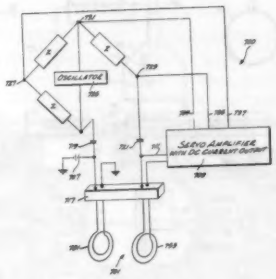
MAGNETIC COUPLED DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENTS

Joseph Weber, Chevy Chase, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 31, 1969, Ser. No. 795,538

Int. Cl. G01v 7/04

U.S. Cl. 73—382 **1 Claim**



This is a detector wherein a dynamic mass quadrupole arrangement includes two parallel conducting energized coils capable of moving relative to each other. The arrangement is coupled to a dynamic gravitational force gradient having a characteristic frequency, the coupling occurring through a dynamic stress-energy-momentum tensor in the quadrupole arrangement. A bridge-servo amplifier electrodynamical circuit resonant at the characteristic frequency is coupled to the coils for providing an output signal.

3,722,288

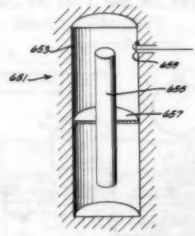
ELECTROMAGNETIC COUPLED DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENTS

Joseph Weber, Chevy Chase, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 31, 1969, Ser. No. 796,312

Int. Cl. G01v 7/04

U.S. Cl. 73—382 **1 Claim**

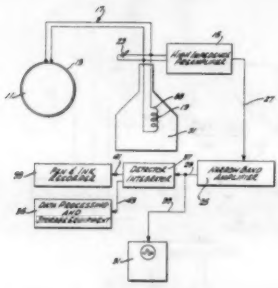


This is a detector wherein a dynamic mass quadrupole arrangement includes electrons and electromagnetic energy in a re-entrant cavity structure consisting of coaxially disposed inner and outer members of superconducting material. The arrangement is coupled to a dynamic gravitational force gradient having a characteristic frequency, at which frequency the cavity structure is electromagnetically resonant. The coupling occurs through a dynamic stress-energy-momentum tensor in the arrangement, and a coupling loop is disposed in the cavity for coupling out electromagnetic energy propagating in the structure.

3,722,289
DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENT FIELDS

Joseph Weber, Chevy Chase, Md., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 28, 1964, Ser. No. 399,632
Int. Cl. B21d 5/02
U.S. Cl. 73—382 5 Claims

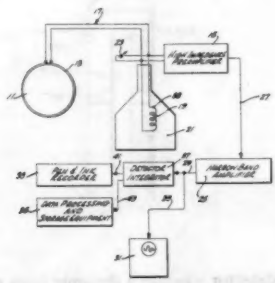


This is an instrument which detects dynamic gravitational force gradient fields and utilizes a body of elastic material with distributed mass including a dynamic mass quadrupole moment responsive to a dynamic gravitational force gradient having a characteristic frequency. The elastic body has a relatively high Q mechanical vibrational resonant mode excited by relative accelerations between portions of the distributed mass caused in the mass quadrupole by the force gradient. An output signal is provided by electrical output means coupled with the vibrational resonant mode to form a relatively high Q electromechanical circuit resonant at the characteristic frequency of the force gradient to be detected.

3,722,290
DETECTOR OF DYNAMIC GRAVITATIONAL FORCE GRADIENT FIELDS

Joseph Weber, Chevy Chase, and David M. Zipoy, Takoma Park, both of Md., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 524,312, Feb. 1, 1966, abandoned, which is a continuation of Ser. No. 399,632, Sept. 28, 1964. This application March 10, 1969, Ser. No. 809,464
Int. Cl. G01v 7/04
U.S. Cl. 73—382 5 Claims

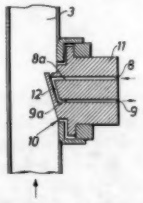


The invention is an instrument for detecting and measuring dynamic gravitational force gradient fields having a characteristic frequency and includes a body of elastic material having distributed mass including a dynamic mass quadrupole moment responsive to dynamic gravitational force gradients by the excitation of a mechanical vibrational resonant mode in the body of elastic material. The resonant mode has a vibration node in the body of elastic material whereat the body is supported. An electrical output is provided by means of at least one piezoelectric transducer coupled to the body which in conjunction with the aforementioned vibrational resonant mode forms an electromechanical circuit which is resonant at a selected frequency corresponding to the characteristic frequency of the dynamic gravitational force gradient.

3,722,291
METHOD AND APPARATUS FOR TAKING SAMPLES OF LIQUID MEDIA

Arne Robert Lindberg, Slingeratan 18, Molndal, Sweden

Filed Nov. 3, 1970, Ser. No. 86,453
Claims priority, application Sweden, Nov. 3, 1969, 15067/69
Int. Cl. G01n 1/14
U.S. Cl. 73—422 R 3 Claims

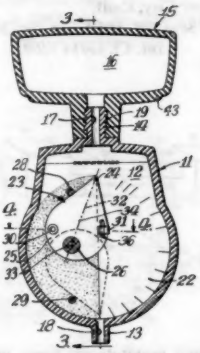


An apparatus and a method for taking samples of liquid media from a main conduit said liquid media comprising the use of a rinsing medium, which through an inlet conduit is led to the immediate vicinity of a sampling point communicating with said main conduit and together with a sampling quantity is withdrawn from said sampling point via an outlet conduit. The sampling quantity instantaneously taken out from said main conduit being determined by corresponding regulation of the flow of said rinsing medium in said conduits.

3,722,292
PIVOTED FLOAT HYDROMETER COMPRISING MOVABLE CALIBRATION WEIGHT

Anthony M. Pietramale, Wheeling, Ill., assignor to I-T-E Imperial Corporation, Chicago, Ill.

Filed Oct. 31, 1968, Ser. No. 772,119
Int. Cl. G01n 9/30
U.S. Cl. 73—454 9 Claims



An antifreeze tester having a chamber for receiving antifreeze fluid to be tested and pivoted float means responsive to the specific gravity of antifreeze fluid within the chamber to indicate the freeze point thereof. An adjustable weight is pro-

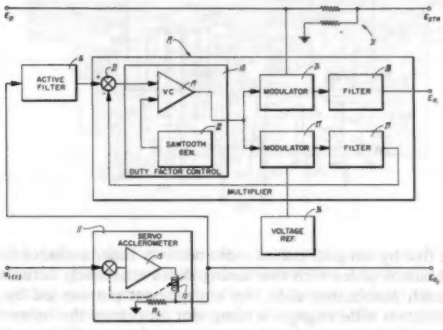
vided on the float means for accurately calibrating the tester. An improved handle construction is provided for facilitated readout of the indicating means. The handle comprises a collapsible bulb structure for effecting movement of the antifreeze fluid to and from the chamber. The handle is further arranged to effectively cause the tester to be utilized in an upright position for improved test accuracy.

3,722,293

ACCELERATION SENSING SYSTEM

Harold D. Morris, Orinda, Calif., assignor to Systron-Donner Corporation, Concord, Calif.

Filed July 11, 9169, Ser. No. 841,041
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R **8 Claims**



Acceleration sensing system having a servo accelerometer and multiplier in which the output of the accelerometer is filtered and supplied to the multiplier so that there is produced a d.c. output which is simultaneously proportional to the acceleration and an input variable d.c.

ERRATUM

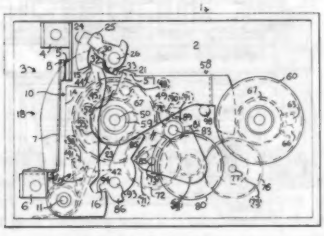
For Class 72—294 see:
Patent No. 3,722,277

3,722,294

DUAL ADJUSTMENT CYCLING TIMER

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Sept. 27, 1971, Ser. No. 183,779
Int. Cl. G05g *21/00*
U.S. Cl. 74—3.52 **11 Claims**



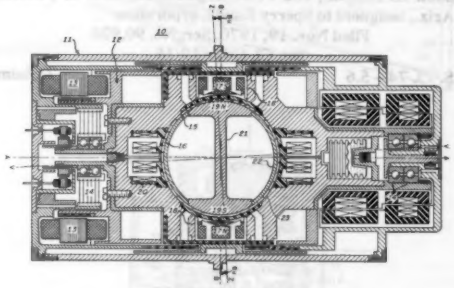
A continuous cycling timer in which the on and off periods are independently adjustable. A single motor drives two spring return timing discs through a clutch engaging one or the other. The disengaged disc resets to its starting point when the other disc is engaged. The timer load switch and clutch are controlled by a single actuator controlled by both timing discs. When the switch is closed, the on period timer operates. When the switch is open, the off period timer operates.

3,722,295

MULTIPLE ROTATION GYROSCOPE WITH HYDRODYNAMIC SUSPENSION

William O. Passarelli, Jr., Jericho, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 97,466
Int. Cl. G01c *19/16*
U.S. Cl. 74—5 **6 Claims**



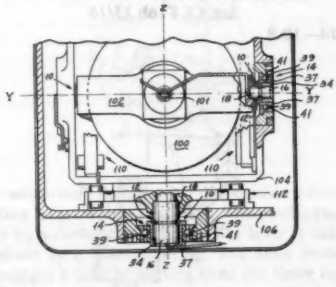
A gyroscopic device having an inertial element that is hydrodynamically suspended within a centralized cavity of a gimbal rotating simultaneously about two mutually perpendicular axes in which the moment of inertia and angular velocity about the first axis is greater than the moment of inertia and angular velocity about the second axis. Synchronously applied decentralizing forces acting on the inertial element are resisted by additional bearing surfaces that combine with the component of rotation having the smaller angular velocity to increase the restoring force on the inertial element in the direction of the decentralizing forces thereby maintaining the inertial element centered within the gimbal.

3,722,296

ANTIFRICTION BEARING WITH COMPENSATING FLEXURAL PIVOT IN A FREE AXIS GYROSCOPE

Charles E. Hurlburt, River Edge, and Michael J. Lanni, Ridgewood, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Jan. 19, 1971, Ser. No. 107,761
Int. Cl. G01c *19/18*
U.S. Cl. 74—5 **6 Claims**



An antifriction bearing with compensating flexure pivot, including a shaft supporting a load and mounted in a suitable ball bearing arrangement with a flexural pivot device operatively connected in the shaft intermediate the load and the bearing so as to provide a free axis of a gyroscope. Thus one

operative part of the flexural pivot is secured with an inner race of the bearing so as to permit large angular freedom of movement of one gimbal of the gyroscope relative to another gimbal of the gyroscope about the free axis provided by attaching the other operative part of the flexural pivot to one gimbal of the gyroscope, and an outer race of the bearing arrangement to the other gimbal of the gyroscope so that the deflection of the flexural pivot may in effect be always kept nearly at null so that torque transmitted to the load due to friction at the bearing may be considered of a negligible effect and the bearing substantially frictionless.

3,722,297

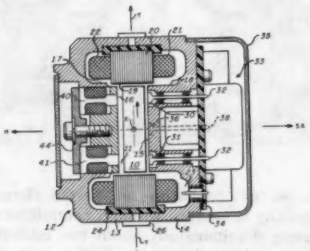
FLUID BEARING GYROSCOPE

Damon H. Duncan, and Peter E. Jacobson, both of Phoenix, Ariz., assignors to Sperry Rand Corporation

Filed Nov. 19, 1970, Ser. No. 90,926

Int. Cl. G01c *19/18*

U.S. Cl. 74—5.6 **7 Claims**



A frictionless, zero hysteresis two axis angular rate sensor of the gyroscopic type wherein a one piece, disk-shaped rotor, generally of the form of a "checker," is electrically spun at high speed and hydrodynamically suspended within a correspondingly shaped cavity in a fixed housing, the rotor constituting the total gas bearing surfaces, the armature of the electric rotor spin motor, the armature of electric pick-offs for detecting precession of the rotor, and the armature of an electric torquer for imposing a rate command for control and self-test purposes; the rotor/cavity wall surface interface being so configured as to maximize the radial support stiffness, the stability of the rotor along the spin axis and the sensitivity of the rotor to angular forces at right angles to the spin axis.

3,722,298

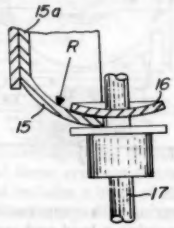
DISENGAGEABLE TUNER CONTROL APPARATUS

M. Richard Tennerstedt, Wilmette, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 14, 1971, Ser. No. 152,639

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.8 **6 Claims**



There is provided for a radio tuner a disengageable friction drive apparatus which comprises a pair of frictionally engageable spherical-segment discs each having the same radius of curvature thereby being able to smoothly engage each other in an operative relationship irrespective of the angle at which the shafts intersect.

3,722,299

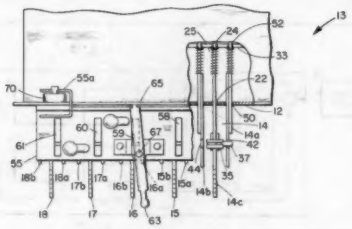
CAM ACTION TUNING SLIDES

Theodore L. Knight, Newport News, and Raymen F. Emery, Yorktown, both of Va., assignors to The Bendix Corporation, Newport News, Va.

Filed Aug. 18, 1971, Ser. No. 172,696

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.33 **3 Claims**



A five by ten pushbutton radio receiver tuner includes five pushbutton slides with two tuning slides alternately actuated by each pushbutton slide. An engagement pin carried by a pushbutton slide engages a ramp slot on one or the other of the tuning slides associated with that pushbutton slide to actuate the tuning slide when the pushbutton slide is actuated. Simultaneously, the engagement pin operates against the ramp slot forcing the tuning slide against a vertical stop to thus remove vertical play from the tuning slide.

3,722,300

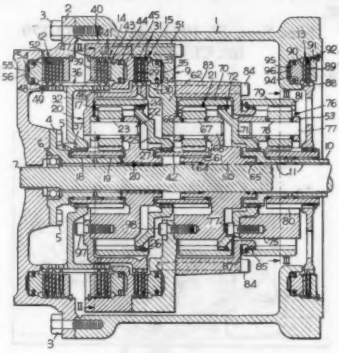
POWER SHIFT PLANETARY TRANSMISSION

James W. Crooks, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 22, 1971, Ser. No. 191,717

Int. Cl. F16h *37/00, 37/06*

U.S. Cl. 74—15.63 **10 Claims**



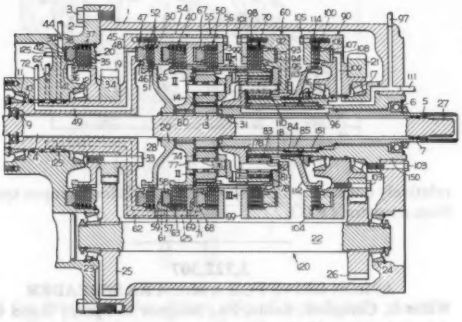
A power shift planetary transmission having planetary gearsets and a clutch carrier for selectively providing a multiplicity of power paths at selective speed ratios through the transmission.

3,722,301

POWER SHIFT PLANETARY AND COUNTERSHAFT TRANSMISSION

James W. Crooks, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 22, 1971, Ser. No. 191,719
Int. Cl. F16h *37/00, 37/06*
U.S. Cl. 74—15.63 10 Claims



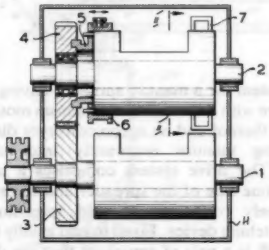
A power shift transmission having planetary and countershaft gearing with clutch carriers for selectively transmitting power through the front planetary gearset or countershaft gearset with rear clutch carriers for transmitting through the rear planetary gearset to the output shaft.

3,722,302

DRIVE HAVING IMBALANCED ROTATABLE SHAFTS

Paul Piatkowski, Kiel, and Manfred Birkholz, Schonkirchen, Uber Kiel, both of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Aug. 18, 1971, Ser. No. 172,726
Claims priority, application Germany, Oct. 23, 1970, P 20 52 036.9
Int. Cl. F16h *33/20*
U.S. Cl. 74—61 6 Claims



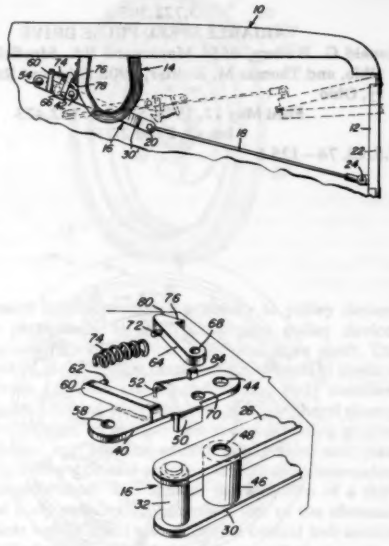
A housing accommodates a body of liquid and two imbalanced shafts which are journalled for rotation. One gear is mounted on one of the shafts for rotation therewith and another gear meshing with it is mounted on the other shaft for rotation relative thereto. A coupling arrangement is fast with the other shaft and normally engages with the gear thereon so that the shaft turns with the gear, but can be disengaged when the shaft reaches a certain angular position. Projections provided on the circumference of the shaft and entering into the body of liquid will quickly brake the rotation of the shaft when the latter becomes disconnected from its associated gear.

3,722,303

BUS DOOR OPERATOR WITH POSITIVE LATCH

Wilbur C. Rumph, Marshallville, and William Leon Ragan, Henderson, both of Ga., assignors to Blue Bird Body Company, Fort Valley, Ga.

Filed Oct. 26, 1971, Ser. No. 192,093
Int. Cl. F16h *21/44*
U.S. Cl. 74—96 11 Claims



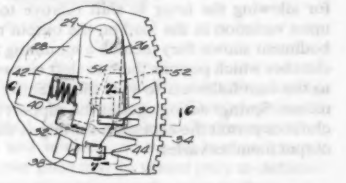
A vehicle door opening operating arm assembly including a handle releasable latch operative to prevent the operating arm for the door to move from the position thereof assumed when the door is closed until such time as a pull is exerted on the handle in a predetermined direction.

3,722,304

STEP-BY-STEP DRIVE FOR TIMER

George Obermann, Niles, Ill., assignor to Controls Company of America, Melrose Park, Ill.

Filed Oct. 1, 1971, Ser. No. 185,527
Int. Cl. G05g *1/00*
U.S. Cl. 74—112 3 Claims



The continuously driven drive disc carries a drive pawl and a retracting lever on the same pivot. The pawl is biased against the lever by a compressed spring. The lever is held in retractive position by a tension spring. The lever includes a cam which engages a tab (projecting from the timer end plate) to move the lever to an inactive position against the bias of the tension spring while the drive pawl is restrained from following by reason of engagement of a depending finger with a second tab. Continued rotation of the disc clears the finger from the second tab allowing the compressed spring to drive the pawl into engagement with the internal teeth on the timer

cam drum thus driving the drum until the lever clears its tab and is retracted by the second (tension) spring. As the lever is retracted it picks up the pawl and retracts the pawl and the drive step is completed. The drive is more economical than the usual stored energy step drive but is more expensive than a creep-type drive. It makes possible variations in steps (degrees and frequency) and even continuous (rapid) drive.

3,722,305

VARIABLE SPEED PULSE DRIVE

Ronald G. Walters, 6556 Maplewood Rd., Mayfield Heights, Ohio, and Thomas M. Zwitter, 9906 Fairmont Rd., Newbury, Ohio

Filed May 12, 1971, Ser. No. 142,473

Int. Cl. F16d *27/10*

U.S. Cl. 74—125.5 **13 Claims**

A drive or transmission mechanism including a rotary cam means having a plurality of lobes and adapted to be rotated about a first axis. Engaged by the cam means are a plurality of cam followers biased toward the first axis and constrained against all movement except reciprocal movement generally radially of the axis. Each of the cam followers engages a separate lever means drivingly connected to separate overrunning clutches such that during rotation of the cam, oscillation of the lever means will cause the overrunning clutches to be given intermittant unidirectional movement. The clutches are drivingly connected to a rotary output member which, for example, can be a ring gear or the like. Means are also shown for allowing the lever to shift relative to the cam followers upon variation in the load on the output member. In the embodiment shown they include a mounting for the overrunning clutches which permits them to shift circumferentially relative to the cam followers to vary the effective length of the lever means. Springs acting against the support for the overrunning clutches permit the necessary shifting as the load on the rotary output member varies.

3,722,306

APRON DRIVE FOR A MANURE SPREADER

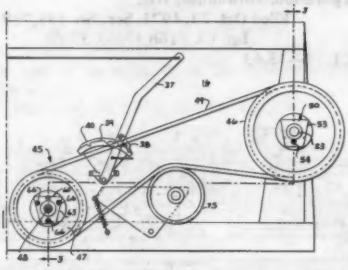
Willis R. Campbell, Leola, and Warren H. Brackbill, Paradise, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 1, 1971, Ser. No. 194,234

Int. Cl. F16h *7/02, 37/00*

U.S. Cl. 74—219 **14 Claims**

A main drive for a manure spreader including a pair of sheaves adapted to be conveniently interchanged between an input shaft and a propeller or output shaft for maintaining a relatively constant output speed for two different input speeds from a tractor's PTO.



3,722,307

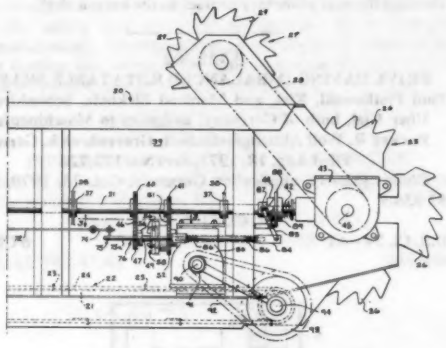
APRON DRIVE FOR A MANURE SPREADER

Willis R. Campbell, Leola, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Nov. 1, 1971, Ser. No. 194,332

Int. Cl. F16h *7/02, 37/00*

U.S. Cl. 74—219 **13 Claims**



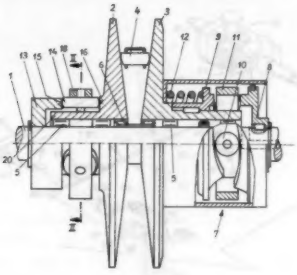
A drive system for a manure spreader having a wagon type body structure with a spreading mechanism mounted transversely the rear thereof and an apron conveyor disposed therein for conveying manure rearwardly into said spreading mechanism. The drive system comprises a propeller shaft mounted on one side of the spreader and having its rearmost end operatively connected to said spreading mechanism through a clutching device. Fixed to and axially spaced on said propeller shaft is a pair of sprockets that are drivingly interconnected to a pair of driven sprockets rotatively journalled on a second drive shaft which is spaced adjacent and extends generally parallel to said propeller shaft and is adapted to drive said apron conveyor. Each of said driven sprockets includes clutch dogs about their inner side which are adapted to engage clutch dogs on the outer sides of a clutch collar keyed to said second drive shaft intermediately between said driven sprockets and slideable therealong for selective engagement with the clutch dogs of the driven sprockets. The clutch collar is actuated by an actuating mechanism that is further operatively connected to said clutching device and particularly adapted to declutch the spreading mechanism without affecting the apron conveyor.

3,722,308

BEARING OF THE CONICAL DISCS OF AN INFINITELY VARIABLE CONE PULLEY TRANSMISSION

Herbert Steuer, Bad Homburg, Germany, assignor to Reimers Getriebe A.G., Zug, Switzerland

Filed April 5, 1971, Ser. No. 131,171
Claims priority, application Germany, April 4, 1970, P 20 16 181.3
Int. Cl. F16h 11/06
U.S. Cl. 74—230.17 M 7 Claims



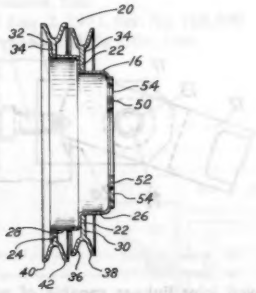
On the driving and/or driven side of an infinitely variable cone pulley transmission the pulley discs are urged against a shoulder of the transmission shaft by the force of a helical coil spring exerted on the disc pair in axial direction. The annular surface of the shoulder which faces the cone discs and the annular surface of an extension of the hub of the cone disc which faces the shoulder are used as the bearing surfaces or races of a thrust bearing. The thrust bearing comprises roller elements mounted rotatably on a support ring and having the form of oblate spheroids. By this particular form the frictional sliding movement between the roller elements and the bearing surfaces, resulting from the wobble movement of the pulley disc, is turned into a purely rolling motion.

3,722,309

MULTIPLE GROOVE SHEAVE

S. Ralph Shaffer, Jeffersonville, Ind., assignor to Arrowhead Engineering Corporation, Knox, Ind.

Filed May 28, 1971, Ser. No. 147,895
Int. Cl. F16h 55/44
U.S. Cl. 74—230.8 7 Claims



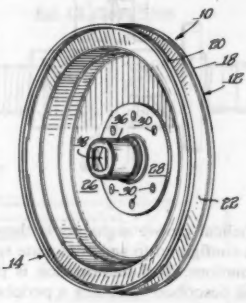
A multiple groove sheave in which a hub is formed with a plurality of axially spaced, radially extending, annular surfaces of different diameters, and a plurality of generally plate-like annular members with peripheral belt grooves therein secured to the annular surfaces in axially aligned relationship. The hub is preferably a sheet metal stamping and the grooved members are preferably formed by splitting the peripheral edge and parting the flanges formed by the split to provide the belt grooves. A method involving the steps of forming the hub and grooved members and securing the two parts together is also part of the broader concept of the disclosure.

3,722,310

PULLEY DEVICE

Edward H. Schultz, Jr., Glencoe, Ill., assignor to The Nagel-Chase Manufacturing Company, Chicago, Ill.

Filed Dec. 6, 1971, Ser. No. 204,899
Int. Cl. F16h 55/52
U.S. Cl. 74—230.8 10 Claims



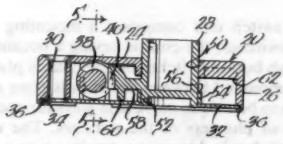
The present invention relates generally to pulley devices and more particularly to sheet-metal type pulley devices adapted to accommodate a non-cylindrical drive shaft. The embodiment of the invention disclosed in the present application comprises first and second sheet-metal body members having annular abutting plate sections, and peripheral diverging sections defining an annular belt-accommodating groove. Central integral hub sections extend axially from said plate sections and define a central aperture shaped to accommodate a non-cylindrical shaft. The annular plate section of a third sheet-metal body member superimposes one of the aforesaid abutting plate sections and also defines a central hub section spaced axially from the other hub sections, said plate sections being in fixed abutting relation.

3,722,311

WINDOW OPERATOR

Lyle M. Northrup, New Hampton, Iowa, assignor to Lynor Engineering, Inc., New Hampton, Iowa

Filed Nov. 26, 1971, Ser. No. 202,153
Int. Cl. F16h 1/16, 57/02
U.S. Cl. 74—425 7 Claims



An improved window operator including a housing having an open side to be closed by a cover plate. The open side of the housing is provided with a peripheral lip formed of a deformable material and inwardly of the lip is a peripheral ledge on which the cover plate may be seated prior to deforming the lip over the cover plate to retain the same in place.

3,722,312

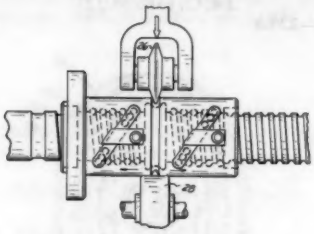
METHOD AND NUT FOR PRELOADING BALL SCREW ASSEMBLIES AND METHOD OF MANUFACTURE OF THE PRELOAD NUT MEMBER

Bernard R. Better, and Edward Hain, both of Chicago, Ill., assignors to The Bendix Corporation, Southfield, Mich.

Filed March 23, 1971, Ser. No. 127,213
Int. Cl. F16h 55/22, 55/18
U.S. Cl. 74—459 12 Claims

An improved method and nut for preloading ball screw assemblies in which the preloading is accomplished by axially

offsetting segments of the internal helical grooves of the nut member, the method comprising permanently deforming an intermediate portion of the nut member so as to cause an axial shift of the connected nut member portion and thus result in



axially offset helical groove segments in these portions. The nut member is configured to accommodate readily large permanent deformations. This deformation is produced in the specific process described by rolling a peripheral groove into the nut member.

3,722,313

PUSH BUTTON SWITCH UNITS

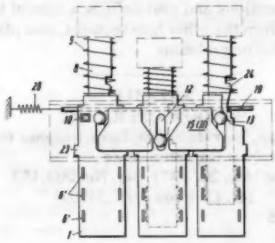
Rudolf Schadow, Konigsbacher Zeile 25, Berlin-Frohnau, Germany

Filed May 10, 1971, Ser. No. 141,852

Claims priority, application Germany, May 25, 1970, P 20 25 504.3

Int. Cl. G05g *13/00*

U.S. Cl. 74—483 PB **10 Claims**



A push button switch unit comprises a mounting chassis with push button switches, the chassis having a housing plate adjacent to the push button switches on the chassis plate. Flat locking slides are mounted between the chassis plate and the housing plate so as to be able to move side-ways for coordinating the operation of plungers of the switches. The unit includes for each switch a locking pin extending into a hole in the plunger of the respective switch, the hole being perpendicular to the axis of the plunger. An opening is provided in the chassis plate and a slot, corresponding in length to the stroke of the respective plunger, is provided in the switch unit housing plate. The locking pin is arranged to be inserted through the opening in the chassis plate and the slot in the housing plate. The unit further comprises a locking slide adapted to cooperate with the head of the locking pin.

3,722,314

FOOT PEDAL TRANSMISSION CONTROL

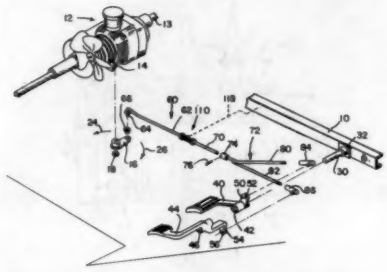
Charles E. Sorenson, Mount Vernon, and Clyde D. Stubblefield, Evansville, both of Ind., assignors to Hahn, Inc., Evansville, Ind.

Filed Feb. 3, 1972, Ser. No. 223,273

Int. Cl. G05g *1/14*

U.S. Cl. 74—512 **11 Claims**

A control for a vehicle driven through a hydrostatic transmission including a control member having selectable positions for controlling the flow of fluid to achieve forward, reverse and neutral positions, and to govern the speed of the vehicle, and with the neutral position of the control member being intermediate its forward and reverse positions. The control includes a trunnion on the vehicle spaced apart from the control member with first and second pedals mounted on the trunnion for pivotal movement, the pedals providing first and second lever portions respectively extending upwardly and



downwardly from the trunnion. The lever portions are connected to the control member by a forked link providing a pair of branches having spaced apart distal ends, one distal end being pivotally connected to one lever portion and the other distal end being pivotally connected to the other lever portion. The branches are springlike in nature such that their distal ends can flex relative to each other when the pedals are depressed. Springs act upon the link yieldably to urge the control member to its neutral position.

3,722,315

HIGH FORCE WITHSTANDING JOINT

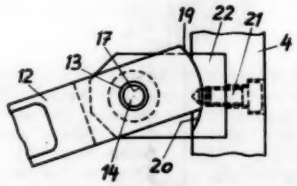
Peter Florjancic, St. Martinstr. 12, Garmisch-Partenkirchen, Germany

Filed April 7, 1971, Ser. No. 132,148

Claims priority, application Austria, April 24, 1970, A 3787/70

Int. Cl. G05g *1/04*

U.S. Cl. 74—520 **3 Claims**

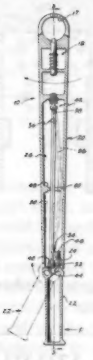


An improved joint linkage capable of withstanding high forces applied thereto having two pairs of contact surfaces; the first pair of contact surfaces being constructed in such a manner as to be capable of withstanding forces of a small magnitude only and adapted for guiding hinged members in their pivotal movement relative to one another; the second pair of contact surfaces being capable of withstanding comparatively high forces and being operable to do so only when the hinged members are at rest longitudinally relative to one another. A predetermined degree of movement in a direction radial to the joint axis is permitted. The improved joint finds particular application in injection molding closure devices utilizing hinged brace members for transmitting extremely high closing forces.

3,722,316
OVERLOAD PREVENTION HANDLE

Harold V. Hawkins, Williamsville, and Joseph E. Forys, Lockport, both of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Aug. 23, 1971, Ser. No. 174,091
Int. Cl. G05g 1/06
U.S. Cl. 74—524 13 Claims

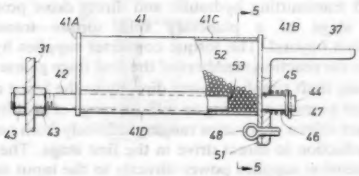


A handle particularly adapted to prevent overloading of chain hoists operated thereby. The handle is characterized as having an operator grasping extension portion pivotally supported on the main body portion of the handle and a constraining device operable to permit movement of the extension portion relative to the main body portion whenever a hoist overload condition producing operating force is applied to the extension portion.

3,722,317
APPARATUS FOR CONTROLLING MOVEMENT BETWEEN RELATIVELY RECIPROCABLE BODIES

Glenn H. Johnson, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Filed Aug. 2, 1971, Ser. No. 168,090
Int. Cl. G05g 5/04, 5/06
U.S. Cl. 74—527 15 Claims

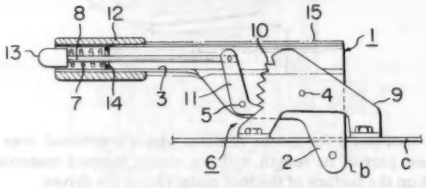


A pair of shafts having a flexible belt disposed about pulleys thereon are mounted for relative reciprocation, a fluid actuator is connected between shaft mountings to urge them apart and thereby maintain tension in the belt, and a means is provided for normally preventing movement of the shafts toward one another in the event the fluid supply to the actuator should fail.

3,722,318
PARKING BRAKE OPERATOR LEVER

Setsuro Asou; Junichi Sugawara; Tukuhei Tanso, and Katsuji Yashiro, all of Yokohama, Japan, assignors to Otsukakoki Kabushikikaisha, Yokohama, Japan

Filed March 23, 1971, Ser. No. 127,245
Claims priority, application Japan, March 23, 1970, 45/90421
Int. Cl. G05g 5/06
U.S. Cl. 74—535 3 Claims

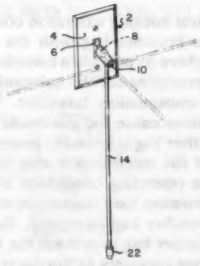


A parking brake assembly wherein the main lever assembly is longitudinally divided so that the operating components of the assembly can be positioned in one of the divided members and the other half is secured thereto which enables automatic assembly of the components.

3,722,319
DEVICE FOR OPERATING THE TOGGLE ARM OF CONVENTIONAL LIGHT SWITCH

Alan A. Reznik, and Marion Reznik, both of 1292 Denniston Avenue, Pittsburgh, Pa.

Filed May 3, 1971, Ser. No. 139,628
Int. Cl. G05g 1/06
U.S. Cl. 74—544 2 Claims

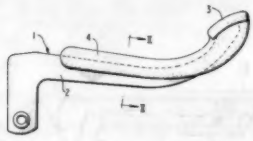


A device for operating the control lever of a conventional light switch including a pliable tubular member for engaging the control lever and an elongated control member having a reduced cross-section at one end terminating in an enlargement. The control member extends through a hole in the tubular member and is held captive therein.

3,722,320
FOOT PEDAL FOR MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed June 29, 1971, Ser. No. 157,831
Claims priority, application Germany, June 30, 1970, P 20 32 159.9
Int. Cl. G05g 1/16
U.S. Cl. 74—560 19 Claims

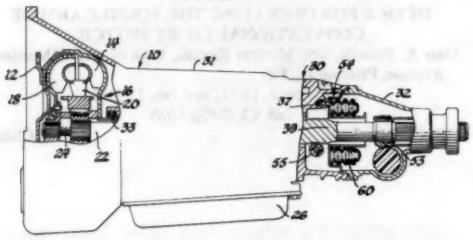


A foot pedal for motor vehicles which is covered over the largest part of its length with an elastic foamed material at least on the surface of the foot pedal facing the driver.

3,722,321
METHOD AND APPAPARATUS FOR TRANSMISSION BREATHING

Frank H. Walker, and Richard W. Craig, both of Grand Blanc, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 27, 1971, Ser. No. 193,111
Int. Cl. F16h 57/04
U.S. Cl. 74—606 R 7 Claims



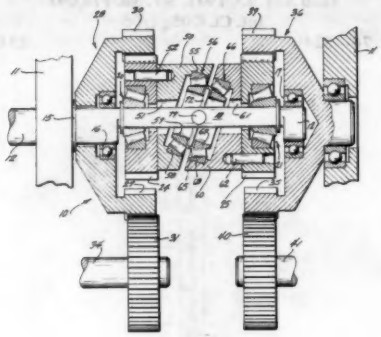
The transmission housing extension contains an expansible and contractable breather bag with the interior of the bag vented to atmosphere to provide a completely sealed breather system thereby providing for the substantial reduction in oxidation of the transmission lubricant. When transmission operating conditions cause the gas inside the transmission to expand, the breather bag is forced to contract and increase the volume inside of the transmission case to accommodate the expansion. When operating conditions are such that the gas within the transmission case contracts, atmospheric pressure will cause the breather bag to expand. Relief valves are provided for the breather bag to prevent the buildup of excessive positive or negative pressures within the transmission.

3,722,322
SPEED CONTROL DEVICE

Erwin Coeppert, 3306 Monarch Drive, Racine, Wis.

Filed May 5, 1971, Ser. No. 140,362
Int. Cl. F16h 37/08
U.S. Cl. 74—675 4 Claims

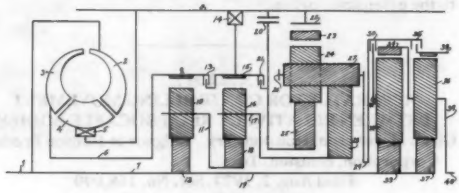
A speed control device having a first gear member and a second gear member and including an operable means to connect the first gear member and the second gear member together for rotation in the same direction in a manner that the speed of the slowest gear member will determine the speed of the other gear member.



3,722,323
TRANSMISSION

Arthur L. Welch, Star Rt., Wasilla, Alaska

Filed March 16, 1971, Ser. No. 124,764
Int. Cl. F16h 37/06, 57/10, 47/08
U.S. Cl. 74—681 3 Claims

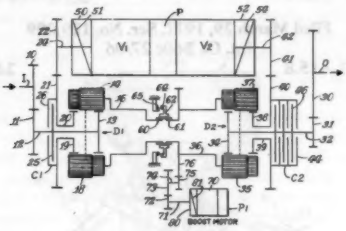


A two stage hydrodynamic and planetary split torque transmission having a first stage of a hydraulic torque converter and a plurality of planetary gearsets and an extension of a driving shaft transmitting hydraulic and direct drive power to a second stage of a planetary split torque transmission mechanism beyond. The torque converter supplies hydraulic power to the reaction members of the first stage gearsets while the driving shaft supplies power directly to the input member of the first gearset, effecting an infinite range of part hydraulic part direct driven gear ratios ranging infinitely from near maximum reduction to direct drive in the first stage. The driving shaft extension supplies power directly to the input members of the second stage planetary transmission mechanism having forward and reverse drive gearsets, while the first stage hydraulic and planetary transmission supplies power of indifinitely variable speed and torque to the second stage planetary gearset reaction members. Since ample torque is available from the first stage to provide reaction for a very low ratio second stage planetary mechanism, a transmission having a very wide range of infinitely variable ratios results. A formula for determining split torque ratios in planetary gearsets operating in split torque drive is given.

3,722,324
HYDROMECHANICAL TRANSMISSION

Michael A. Cordner, and Duane H. Grimm, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 1, 1971, Ser. No. 194,338
Int. Cl. F16h 47/04
U.S. Cl. 74—687 16 Claims

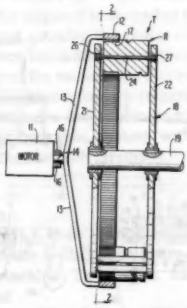


A hydromechanical transmission operable in a plurality of modes, comprising, an input shaft, an output shaft, an intermediate shaft, a pair of variable displacement hydraulic units connected in circuit to function as pump and motor, a first three-element differential connected to the input shaft, to one hydraulic unit and to the intermediate shaft, a second three-element differential connected to the intermediate shaft, to the other hydraulic unit and to the output shaft, means for locking up the second differential to rotate as a unit in a first low speed hydromechanical mode of operation, and means for locking up the first differential to rotate as a unit in a second high speed hydromechanical mode of operation. In a preferred embodiment, a hydraulic boost motor is used to aid in driving the second differential in the first mode. Preferably, the intermediate shaft includes a disengageable clutch coupling with means for holding one element of the first differential when the clutch coupling is disengaged, so that all power is transmitted hydraulically.

3,722,325
TORQUE CONVERTER

Beverly W. Rogers, Route 1, Box 630, Summerville, S.C.

Filed Aug. 11, 1971, Ser. No. 170,872
Int. Cl. F16h 3/74, 5/42, 1/38
U.S. Cl. 74—751 7 Claims

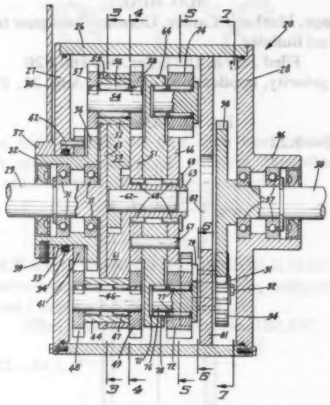


A torque converter of the mechanical type for transmitting power from power means such as a motor to a driven member from which power take-off may be obtained which includes a rotatably mounted ring gear for rotation by the motor having teeth engagable with a drum having a cam groove rotatably mounted on the driven member with one or more weights being guidably mounted on the driven member and engagable with the cam groove so that rotation of the drum by the ring gear moves the weights in a reciprocating manner at a speed proportional to the speed of the ring gear so as to impart periodic inertial forces to the driven member for smoothly transmitting torque from the motor to the driven member throughout the entire speed range from rest to full speed.

3,722,326
VARIABLE SPEED TRANSMISSION

Edward Dorma, 4333 Grimes Avenue, N., Minneapolis, Minn.

Filed June 10, 1971, Ser. No. 151,695
Int. Cl. F16h 5/42
U.S. Cl. 74—752 B 26 Claims

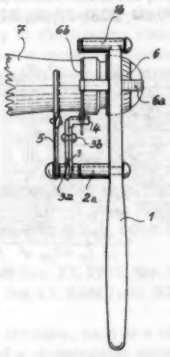


A variable speed transmission having an input drive shaft and an output drive shaft operatively coupled to an eccentrically movable and rotatable structure. A manual or automatic control arrangement connects the input drive shaft to the eccentrically movable and rotatable structure to change the eccentric position of the structure relative to the axis of rotation of the input drive shaft. A drive structure, including one-way drive units, drivably couples the eccentrically movable structure with the output drive shaft. The eccentric or nutating movement of the eccentrically movable means operates the one-way drive units to rotate the output drive shaft.

3,722,327
PLIER-LIKE CHAMPAGNE CORK REMOVER

Anna Maria Scharwat nee Strassel, 86 Friedberger Landstrasse, Frankfurt, am Main, Germany

Filed April 5, 1972, Ser. No. 241,107
Claims Priority, application Germany, April 6, 1971, P 21 16 768.0
Int. Cl. B67b 7/44; B25b 7/22
U.S. Cl. 81—3.1 R 2 Claims



A plier-like champagne cork remover comprises means for gripping the free end of the cork of a champagne bottle,

means for guiding the neck of the bottle when the cork secured in the bottle by a wire is being removed, and means for cutting through the cork securing wire when the means for gripping the free end of the cork are being moved towards each other, the arrangement being such that the means for guiding the bottle neck and the means for cutting through the wire move in synchronism with the movement of the means for gripping the free end of the cork.

3,722,328

MARKING NEEDLE FOR A FABRIC MARKING MACHINE

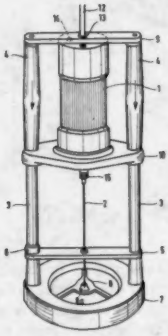
Erwin Lange, Marbach/Lauter, Germany, assignor to Bullmerwerk Karl Bullmer

Filed July 8, 1971, Ser. No. 160,820

Claims priority, application Germany, Aug. 21, 1970, G 70 31 433.9

Int. Cl. B43k *5/00*

U.S. Cl. 81—9.22 **10 Claims**



A marking needle for a fabric marking machine has an elongated, hollow needle body with a tip provided with two opposite perforations. A tube filled with marking liquid is inserted into the needle body and is closed at one end by an insert of porous material which extends from the tube past the perforations and into contact with the needle body at the tip. A cap is threaded into the needle body and bears against a spring in turn bearing against the tube to apply pressure thereagainst and cause the insert to be deformed and bulge outwardly through the perforations.

3,722,329

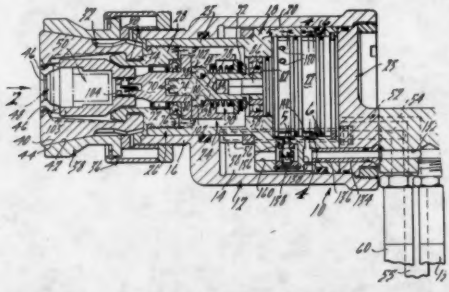
FASTENER INSTALLATION TOOL

George J. Van Hecke, Detroit, and Albert G. Masinda, Royal Oak, both of Mich., assignors to Huck Manufacturing Company, Detroit, Mich.

Filed May 7, 1970, Ser. No. 35,383

Int. Cl. B23p *19/04;* **B25b** *27/00;* **B21d** *9/05*

U.S. Cl. 81—10 **17 Claims**



In a two piece fastener of the type including a bolt and a nut adapted to be threaded onto the bolt and thereafter crimped to provide a desired preload a tool for setting the fastener including means for torquing the nut onto the bolt with a preselected torque and thereafter crimping the nut to provide the desired preload.

3,722,330

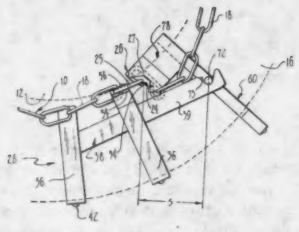
TIRE CHAIN APPLICATOR

Jan C. Smekens, 40 Corte Dorado, Greenbrae, San Rafael, Calif.

Filed March 29, 1971, Ser. No. 129,099

Int. Cl. B60c *27/06*

U.S. Cl. 81—15.8 **24 Claims**



A tire chain applicator for automatically closing at least the inboard chain strand on a vehicle wheel. A first holder is placed over the tire periphery and ends of the chain are secured to the holder to pull the chain over the tire upon rotation of the wheel. A second holder is secured to the other chain end and can be pivotally supported on a portion of the first holder so that a hook on one end of the inboard strand can be pivoted into engagement with a closed link on the other end of the inboard strand. The readily accessible outboard strand of the chain is tightened, closed and conventionally locked to firmly engage the hook and the link on the inboard strand.

3,722,331

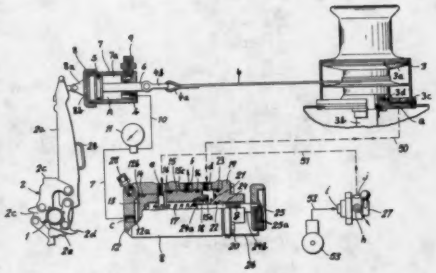
TORQUE-CONTROLLED PIPE-THREAD TIGHTENER

Valentin C. Radulescu, Bucharest, Romania, assignor to IPCUR-Institutul De Proiectari Si Cercetari Pentru Utilaj Petrolier, Bucharest, Romania

Filed June 21, 1971, Ser. No. 154,746

Int. Cl. B25b

U.S. Cl. 81—52.4 **5 Claims**



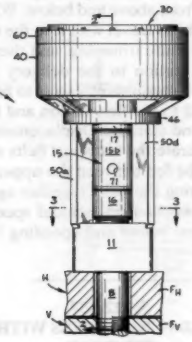
A device for threading lengths of drill pipe together with predetermined maximum torque or tightening moment to form a drill string. A mechanical tongs engages the pipe and is angularly displaced by a pneumatic cathead, a hydraulic transducer being provided between the cathead and the tongs for generating a hydraulic signal representing the applied torque. A hydraulically controlled pneumatic relay is responsive to this signal to release the cathead when the predetermined torque is attained.

3,722,332

APPARATUS FOR SECURING THE BOLTS OF THE REACTOR PRESSURE VESSEL HEAD TO THE REACTOR PRESSURE VESSEL

Cecil R. Jones, San Jose, Calif., assignor to Transfer Systems Incorporated, New York, N.Y.

Filed June 1, 1971, Ser. No. 148,617
Int. Cl. B25b 29/02
U.S. Cl. 81—57.38 15 Claims



Apparatus securing a locking bolt of a pressure head to a reactor pressure vessel in which the pressure head flange is urged in one direction and the bolt is tensioned in an opposite direction to reduce the interfacing force between confronting walls of a nut securing the locking bolt and the pressure head flange, while an operator tightens the nut against the pressure head flange. For tensioning the bolt, a cylindrical force transmitting member has its lower end threaded for engagement with the locking bolt and it upper end threaded, but without any pitch, to receive in threaded engagement a puller or lifter rod similarly threaded. The force transmitting member is split axially so that its halves can be displaced radially to facilitate the retaining of the lifter rod in threaded engagement therewith, while rotating the force transmitting member for adjustable threaded engagement with the locking bolt without rotating the puller rod. Axially movable retaining sleeves surround the split force transmitting member for at times to permit separation thereof to retain the lifted rod in threaded engagement therewith while rotating the force transmitting member for adjustable threaded engagement with the locking bolt without rotating the puller rod, and at other times securing the force transmitting member in locking engagement with the lifter rod for movement therewith. For urging the flange in the one direction a force is transmitted through columns and a connector sleeve for application to the pressure head flange. A suitable hydraulic system with pistons initiates the transmitted forces in each direction.

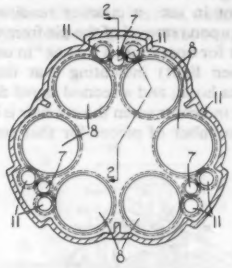
3,722,333

MULTI-SPINDLE AUTOMATIC LATHES

Harold James Gilbert, Coventry, England, assignor to Wickman Machine Tool Sales Limited, The Hill, Coventry, England

Filed Aug. 5, 1970, Ser. No. 61,372
Claims priority, application Great Britain, Aug. 5, 1969, 39,056/69
Int. Cl. B23b 19/02
U.S. Cl. 82—29 2 Claims

A multi-spindle automatic lathe in which a spindle drum is indexible in a housing, with a plurality of work spindles being carried by the drum, gearing interconnecting a drive means with the work spindles to provide at least one work spindle speed in one direction of rotation and at least one work spindle speed in the opposite direction of rotation. A pair of clutches are mounted on each work spindle and are selectively actuable for drivingly connecting the drive means via the gearing to the work spindle so that each work spindle can be driven in either direction of rotation regardless of the direction of rotation of the other work spindles.

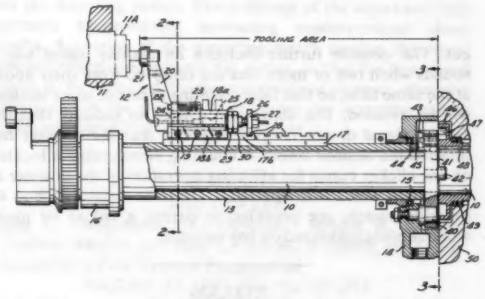


3,722,334

STOCK STOP IN MULTIPLE SPINDLE MACHINE

Karl P. Schubert, Mayfield Heights, Ohio, assignor to Acme-Cleveland Corporation, Cleveland, Ohio

Filed Sept. 15, 1971, Ser. No. 180,697
Int. Cl. B23b 3/36, 3/34
U.S. Cl. 82—34 A 11 Claims



The cover sleeve for the drum shaft at the tooling area in a multiple-spindle machine tool supports the stock stop. A cam-operated mechanism acts between the drum shaft and the cover sleeve for turning the latter to move the stock stop between an inoperative, out-of-the-way position and an operative position for engagement by the workpiece stock which is being fed axially at the loading station in the machine. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,722,335

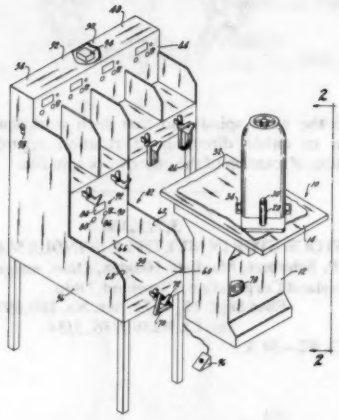
COUNTING APPARATUS FOR PROCESSING MACHINE

Roland J. Labonte, 15731 West Eldorado Drive, New Berlin, Wis., and Smiley H. Jones, 1090 Links Court, Brookfield, Wis.

Filed Dec. 27, 1971, Ser. No. 212,121
Int. Cl. B26f 1/40; B26d 7/28
U.S. Cl. 83—57 16 Claims

A processing machine, such as a clicker cutter comprises a fixed platen and a reciprocably movable operating head for delivering a blow to a cutting die placed on sheet material on the platen beneath the head. A console which includes several

stations (one for each differently-shaped piece of material to be cut is adjacent the cutting machine. Each station comprises a storage area for cut pieces; a counter; a movable hook adjacent the storage area on which the die for that station is placed when not in use; a counter readiness or energizer switch operable upon removal of the die from the hook to connect the counter for operation; a first or "in use" signal device (such as a green light) indicating that the die has been removed from its hook; and a second signal device (such as a red light) which indicates when the counter is indicating that a predetermined number of pieces for that station have been



cut. The console further includes an audible alarm which sounds when two or more dies are removed from their hooks at the same time, so that false counting at one or more stations will be avoided. The alarm also sounds to indicate that the second signal device is operating, i.e., that the counter has finished the desired count. A counting switch relay is located on the clicker cutter for effecting operation of the counter at the station which is in operation. Override means, such as an override switch, are provided to permit a cut to be made without being registered on any counter.

3,722,336

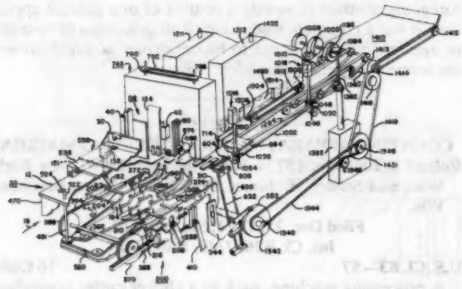
FEED, TRANSPORT AND DELIVERY MECHANISM FOR BOOK TRIMMERS AND THE LIKE

Ernest J. Sarring, Western Springs, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Feb. 10, 1971, Ser. No. 114,225

Int. Cl. B26d 7/24

U.S. Cl. 83—63 **5 Claims**



Apparatus for feeding objects to a transport mechanism and transport and delivery mechanisms for the objects, and, in particular, apparatus for feeding books to, transporting them through the cutting stations of and delivering them from a two-station, three-knife book trimmer. The feed mechanism includes a hopper for holding books, a prestripper for stripping a book from the hopper and moving it part way to the front knife cutting station and pushers, which continue to feed the book to the first cutting station, with means coordinating the prestrippers and pushers. The transport mechanism includes a plurality of displaceable, e.g. upper transport belts and a plurality of belts in opposition to the displaceable ones, e.g. lower transport belts, which clamp the book, respectively, from above and below. While clamping the book, the transport belts travel with it to the side knife cutting station, halt for side knife trimming, and then move the book beyond the second station to the delivery mechanism. The transport belts travel intermittently so as to be stationary when the book is delivered to the first station and to halt the object at the first and second stations. Displacement means, e.g. for the upper belts, separate the transport belts at the first station to permit a book to be fed between the upper and lower belts, and return means bring the belts together again to clamp the book. The delivery mechanism includes speeder belts for engaging the book from below and speeding it away from the transport belts.

3,722,337

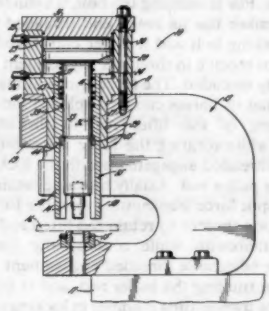
FLUID-ACTUATED PUNCH PRESS WITH WORKPIECE STRIPPER

Theodore F. Brolund, Rockford, Ill., and William E. Kuchar, Cherry Valley, Ill., assignors to W. A. Whitney Corp., Rockford, Ill.

Filed Dec. 31, 1970, Ser. No. 103,025

Int. Cl. B26d 7/06

U.S. Cl. 83—137 **3 Claims**



The press includes a fluid-operated actuator for reciprocating a punch and also includes a stripper which is partially telescoped into the cylinder of the actuator so as to be forced downwardly into clamping engagement with the workpiece by the same pressure fluid admitted into the cylinder to retract the punch upwardly out of the workpiece. In addition, the actuator and a spring disposed within the cylinder coact to cause the stripper to clamp the workpiece during punching and to release the workpiece after the punch has been retracted out of the workpiece.

3,722,338

APPARATUS AND PROCESS FOR THE TREATMENT OF SPENT FUEL

Guy Henry Cherel, Bougival France, assignor to Saint-Gobain Techniques Nouvellas, Courbevoie, France

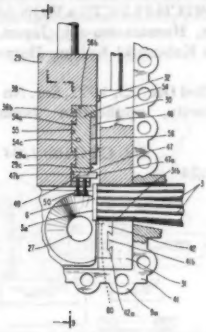
Filed Feb. 25, 1970, Ser. No. 13,946

Int. Cl. B23d 15/04, 35/00

U.S. Cl. 83—278 **32 Claims**

Apparatus for shearing into sections or fragments, the tubes containing nuclear fuel of combustion elements, and which

are secured together by lateral, longitudinally-spaced tie rods or bands. After removal of the inert ends with which each element is commonly provided, the bundle of tubes, sans ends, is moved longitudinally by steps of 20 to 30 mm each, into a shearing apparatus wherein after each step the bundle of tubes is clamped to a fixed stop or surface and the projecting ends are sheared off by a reciprocating shearing tool to thus form a number of fragments of tube and fuel each. In the prior art when two successive shearing cuts were on opposite sides respectively, of a tie band, the band still held the cut fragments together in a unitary mass of excessive size, capable of



clogging the pipes leading to the tank in which the fuel or the metal of the tubes is dissolved. To obviate that disadvantage the present invention incorporates into the reciprocating shearing tool, a shearing tooth projection fixed therewith and which is spaced ahead of the shearing edge of the tool in the direction of the working stroke. The construction is such that when a tie rod or band is advanced into position to be sheared off on the next stroke of the shearing tool, the projection first engages and shears the band to thus allow the subsequently-sheared fragments of fuel and tubes to disintegrate or separate as the tool completes its shearing stroke.

3,722,339

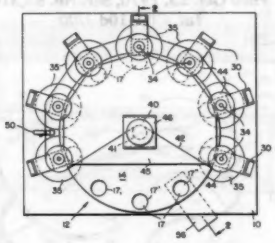
ONION SLICING MACHINE

Emanuel F. Boyer, 4826 Oak Orchard Rd., Albion, N.Y.

Filed March 19, 1971, Ser. No. 126,137

Int. Cl. A23n *15/100*; B26d *4/04*

U.S. Cl. 83—4 **2 Claims**



Onions to be sliced are placed in pockets formed in a rotary table made up of a plurality of coaxial horizontal discs that are mounted on top of one another to rotate about a common axis. Around the table are disposed a plurality of rotary knives, which are positioned in interleaved relation with the onion holding discs but which are disposed at progressively different vertical positions so that successive knives are interleaved with progressively different pairs of onion transporting discs. As the transport discs revolve, therefore, the knives cut the onions in the pockets into slices.

3,722,340

AUTOMATIC SHEET-FEEDING DEVICE

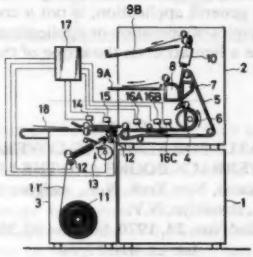
Yugoro Kobayashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1971, Ser. No. 110,510

Claims priority, application Japan, Feb. 14, 1970, 45/12260

Int. Cl. B26d *5/20*

U.S. Cl. 83—203 **6 Claims**



In an automatic sheet-feeding device having utility in a copying machine, there are provided a cutter for cutting a sheet from a web (e.g. a strip of a recording medium) in accordance with the size of another sheet (e.g. an original sheet to be copied), a switch for detecting the trailing end of a moving original sheet, and a plurality of signal switches adapted to be actuated in succession by a signal-transmitting element incident to advance of the original sheet along a defined path past the detecting switch. The positions of the signal switches represent progressively increasing predetermined sheet lengths. Actuation of the detecting switch renders the signal switches effective to actuate the cutter, so that the first signal switch to be actuated by the transmitting element after the trailing end of the original sheet passes the detecting switch produces a signal that actuates the cutter.

3,722,341

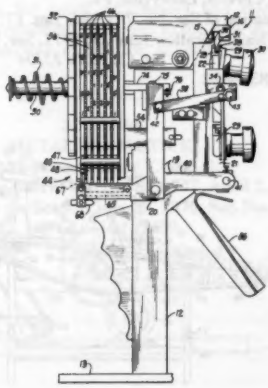
KEY CUTTER

Philip C. Hungerford, Jr., Cleveland; Robert H. Richens, Bedford Heights, and John L. Gereby, Wickliffe, all of Ohio, assignors to Cole National Corporation

Filed Jan. 18, 1971, Ser. No. 107,311

Int. Cl. B26d *7/06*

U.S. Cl. 83—413 **37 Claims**



A key cutter is disclosed which is a hand-actuated machine adapted to cut key blanks in accordance with a preset manufacturer's code which sets the depth of cut of each notch and

the longitudinal spacing between successive notches. Alternatively, the key cutter may be used as a duplicator to cut a blank key in accordance with a master key. This duplicating function is aided by a parallelogram vise assembly which carries both the blank key and the master key. The key cutting machine automatically indexes to the next successive longitudinal position for key notch cutting with each actuation of the cutter actuating machine and the entire machine may be reset to perform the next cycle of operation by moving the carriage in a single direction. This resets both the depth setting means and the cut spacing means. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,722,342

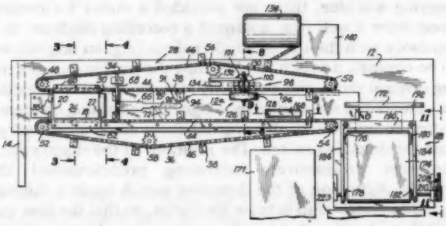
APPARATUS FOR STRIPPING COVERS FROM PAPERBACK BOOKS AND THE LIKE

Vincent N. Vulcano, New York, N.Y., assignor to Compu-Sort Systems, Inc., Brooklyn, N.Y.

Filed Nov. 24, 1970, Ser. No. 92,350

Int. Cl. B26d *1/14*

U.S. Cl. 83—418 **9 Claims**



An apparatus for stripping covers from paperback books and the like comprising means for supplying paperback books, means conveying the paperback books serially from the supply to a cover plow for rotating and opening the cover away from the remainder of the book, a cutter for severing the cover from its book adjacent the book binding, means mutilating the paperback books after their covers are removed, and means for depositing the mutilated books in a receptacle.

3,722,343

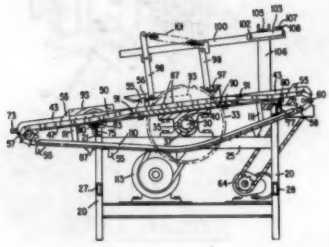
MULTIPLE SAW LUMBER TRIMMER

Cyrus J. Cornell, Laceyville, Pa.

Continuation of Ser. No. 791,986, Jan. 17, 1969, abandoned. This application June 23, 1971, Ser. No. 156,051

Int. Cl. B27b *25/04*

U.S. Cl. 83—422 **9 Claims**



A lumber trimming saw, the conveyor chains of which are provided with prongs located forwardly of each lumber engaging lug. The prongs are normally positioned below the conveyor rails out of engagement with a piece of lumber. As the lumber is advanced by the chain lugs into proximity with the saw, the chains are elevated to move the prongs into engagement with a piece of lumber while it is advanced past the saw. The prongs serve to anchor an area of the piece of lumber which is not engaged by the chain lugs due to warpage of the lumber. Chain guide and guard members are provided in overlying relation to the lower return runs of the conveyor chain.

3,722,344

ELECTRONIC MUSICAL INSTRUMENT HAVING TONE START PITCH FLUCTUATION ARRANGEMENT

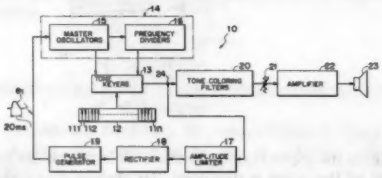
Akira Nakada, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Dec. 23, 1971, Ser. No. 211,602

Claims priority, application Japan, Dec. 26, 1970, 45/119034

Int. Cl. G10h *1/04*

U.S. Cl. 84—1.24 **5 Claims**



An electronic musical instrument including tone generators for generating tone signals each having predetermined tone pitches constituting a musical scale and tone keyers for respectively keying the tone signals, is further provided with a circuit arrangement for fluctuating the pitch of the tone at the start of the tone. The arrangement comprises a detector for detecting the start of the tone signal being played and a pulse generator producing a pulse signal upon receipt of the detected signal and controlling the tone generators to fluctuate the pitches thereof at the start of the tone signals. This simulates the sound of natural musical instruments very closely.

3,722,345

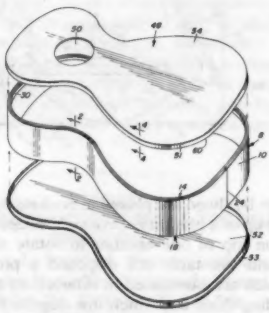
STRINGED MUSICAL INSTRUMENT BODY CONSTRUCTION

Rudolph Dopera, 1410 Gaylord St., Long Beach, Calif.

Filed Oct. 23, 1970, Ser. No. 83,310

Int. Cl. G10d *3/00*

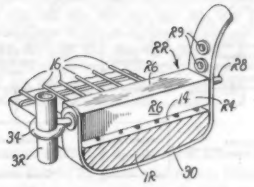
U.S. Cl. 84—291 **5 Claims**



A structure for the soundbox of a stringed musical instrument is disclosed wherein the peripheral side wall is formed

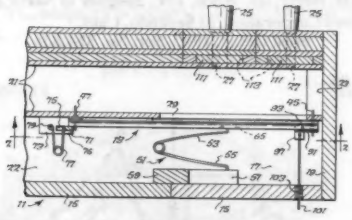
with channels at its bottom and top edges. The bottom and top of the body of the stringed instrument have flange portions on their peripheral edges which engage the channels on the side wall to form the soundbox. Mechanical and/or chemical means for strengthening the coupling between top and bottom flange portions of the body and the side wall channels is provided.

3,722,346
CAPO
Pete P. Valentino, 6061 N. Wilson, Fresno, Calif.
Continuation-in-part of Ser. No. 81,396, Oct. 16, 1972, Pat. No. 3,680,427. This application Feb. 10, 1972, Ser. No. 225,213
Int. Cl. G10d *3/00*
U.S. Cl. 84—318 **6 Claims**



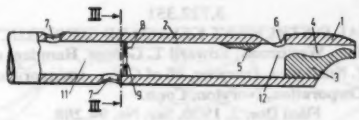
An improved capotasto, hereinafter referred to as a CAPO, for use in tuning string instruments of the type having a fingerboard including a plurality of transversely oriented frets and a plurality of substantially parallel strings traversing the frets. The device conforms to an elongated bar repositionable along a fingerboard of a string instrument for uniformly varying the pitch of all of the strings, and a pitch pipe integrally coupled therewith for establishing a keynote in tuning the instrument. A particular feature of the invention resides in an improved CAPO having integrated therewith a pitch pipe employable in changing the key of the instrument.

3,722,347
PALLET VALVE CONSTRUCTION
Herman L. Schlicker, 50 Halladay Lane, Tonawanda, N.Y.
Filed Nov. 30, 1970, Ser. No. 93,791
Int. Cl. G10b *3/10*
U.S. Cl. 84—342 **5 Claims**



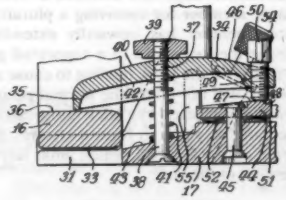
A pallet valve for use in a pipe organ windchest for controlling the flow of air under pressure through an oblong opening in the windchest. The pallet valve comprises an elongated, generally flat, metallic body considerably longer than the opening and pivotally movable at one end about an axis substantially removed from the opening. A pair of laterally spaced, parallel flanges, coextensive with the valve body, depend from one face of the body and serve to reinforce and stiffen it. The other face of the body is provided with a cushion engageable with the area surrounding the opening for sealing the same.

3,722,348
WIND INSTRUMENT
Hendrik Visser, Duinweg 37A, Schoorl, Netherlands
Filed May 1, 1972, Ser. No. 249,182
Int. Cl. G10d *7/00*
U.S. Cl. 84—380 **4 Claims**



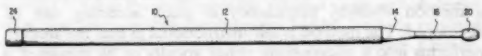
A wind instrument having an embouchure and a resonance passage in which between the embouchure and the resonance passage an antechamber is disposed which is bounded at one end by a plate (tone ring), attached to the wall of the resonance passage transversely of the instrument axis and formed with an aperture, and at the other end by a tongue in the form of one or more raised portions extending from the wall downstream of the embouchure.

3,722,349
DRUM PEDAL
John L. Hoellerich, Wilmette, Ill., assignor to Slingerland Drum Co., Niles, Ill.
Filed Dec. 2, 1971, Ser. No. 204,273
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 R **11 Claims**



A pedal having improved means for connecting the pedal removably to the counter hoop of an axially horizontal musical drum including a beater adapted to beat the drum as a result of a foot operation of the pedal by the drummer. The pedal includes means for facilitated clamping of the pedal to the counter hoop for quick attachment and release. The clamping means is resiliently mounted to the base of the pedal and includes adjustable means for adjusting the clamping force as desired.

3,722,350
METAL DRUM STICK
Charles P. Cordes, 27 Kenneth Place, Clark, N.J.
Continuation-in-part of Ser. No. 812,747, April 2, 1969, abandoned. This application July 29, 1970, Ser. No. 67,674
Int. Cl. G10d *13/00*
U.S. Cl. 84—422 S **7 Claims**



The drum stick is comprised of a hollow, cylindrical, metal tube, open at both ends and provided with a straight, cylindri-

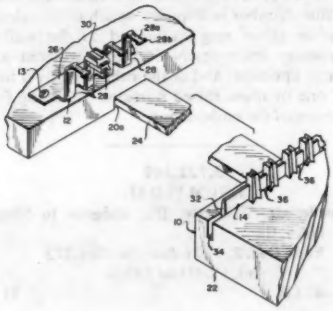
cal tip end portion of reduced diameter. A plastic tip is secured to the butt end of the drum stick. A plastic coating or sleeve may be disposed along the cylindrical portion of the drum stick having the larger diameter. Variations in the sound characteristics can be achieved by varying the length of the reduced diameter, cylindrical tip portion. A solid core may be provided in the larger diameter cylindrical portion of the tube.

3,722,351

MUSICAL INSTRUMENT KEYBOARD CONSTRUCTION

Irving Allen, Westbrook; Edward T. George, Hamden, and Albert W. Nordquist, Ivoryton, all of Conn., assignors to Pratt-Read Corporation, Ivoryton, Conn.

Filed Dec. 2, 1970, Ser. No. 94,288
Int. Cl. G10c 3/12
U.S. Cl. 84—423 **12 Claims**



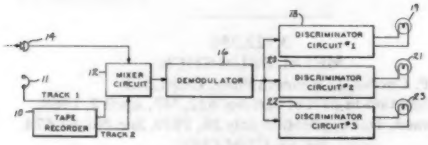
A musical instrument keyboard includes a wood key bed and a pivot-spacer member for receiving a plurality of keys. The pivot-spacer member has upwardly extending spacer posts for confining the key sticks in a supported position so that transverse forces on the keys, tending to cause a torque to be exerted thereon, will not affect the normal position of the keys. The forward end of each key stick cooperates with side tabs of the associated key cap to form a channel for a guide bushing supported on the key bed, which limits lateral and up and down movement of the keys.

3,722,352

PITCH MEASUREMENT CIRCUIT

Elmer A. Ihrke, 4619 N. Cramer St., Milwaukee, Wis., and Walter R. Ihrke, 25 Storrs Heights Rd., Storrs, Conn.

Filed Aug. 16, 1971, Ser. No. 172,051
Int. Cl. G10g 7/02
U.S. Cl. 84—454 **8 Claims**



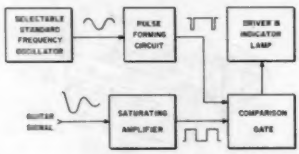
The pitch measurement circuit, in conjunction with a two-track tape recorder and a printed instruction manual, provides a method whereby proficiency in pitch accuracy can be developed. The method is self-instructional in that the student performs into a microphone either vocally or by means of a single-tone musical instrument. The human teacher is absent, and speaks only through the manual and the tape. The student reads the music of the training items from the manual, and performs it against a setting sounded by the tape. Track 1 is an accompaniment to the student's performance. Track 2, which the student does not hear, contains the melody in coded form, each coded tone being 40 cycles less than the corresponding tone of the melody. The student's performance is sent from a microphone into a mixer circuit which also receives the coded melody from Track 2. The resulting mixture is demodulated, and the low-frequency component is sent to a group of frequency discriminators which by means of lights indicate whether the student is sharp, flat, or on pitch.

3,722,353

ELECTRONIC TUNING DEVICE FOR VISUAL TUNING OF STRINGED INSTRUMENTS

Lawrence A. Westhaver, 13001 Old Stagecoach Road, Laurel, Md.

Filed June 11, 1971, Ser. No. 152,246
Int. Cl. G10g 7/02
U.S. Cl. 84—454 **4 Claims**



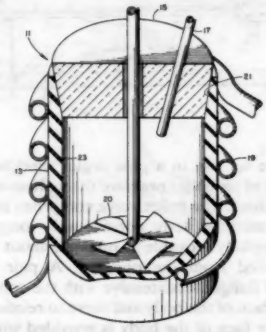
An electronic tuning device for tuning stringed instruments provides a selectable sinusoidal reference frequency which is converted to pulses of the same frequency. The fading picked-up signal from a string of the instrument is passed to a high-gain saturating amplifier and converted to a sustained square wave which lasts of the order of 5 to 10 seconds as the string signal becomes minimal. The frequency of the square wave is then compared with the pulse frequency by supplying the pulses and the square waves to a comparator gate whose output controls a glow discharge lamp attached to the device. When the string of the instrument is tuned to bring the frequency of the square wave close to that of the pulses, the frequency difference to be minimized is indicated by the observable blink frequency of the lamp. The instrument responds similarly to one octave above the tuned frequency. Provision is also made to deliver the selected reference frequency to the usual musical instrument amplifier to enable aural tuning by a group of musicians.

3,722,354

PROPELLANT CASTING

Charles H. Herty, III, Waco, Tex., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 3, 1963, Ser. No. 314,836
Int. Cl. C06b 21/02; F42b 9/14
U.S. Cl. 86—1 **3 Claims**



1. A method of preparing a solid propellant comprising: providing a vessel of polymeric material,

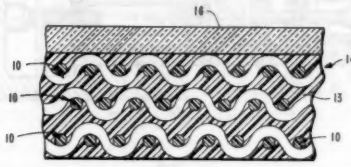
individually pouring the separate ingredients for said solid propellant into said vessel,
disposing in said vessel means for mixing said ingredients,
mixing said ingredients in said vessel,
and curing said ingredients in said vessel.

3,722,355

LIGHTWEIGHT ARMOR MATERIAL

Harry A. King, Covina, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 3, 1965, Ser. No. 477,671
Int. Cl. F41h *1/02, 5/04*
U.S. Cl. 89—36 A **7 Claims**



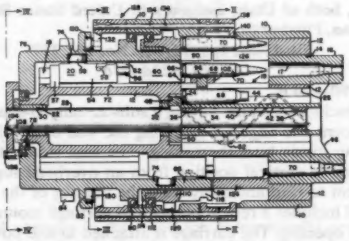
This disclosure concerns a lightweight armor material which includes a woven fabric of glass and nylon fibers, wherein the individual glass fibers are interlaced with individual nylon fibers so as to provide an interwoven relationship between the glass fibers and the nylon fibers. A woven fabric of this character is especially suitable for use in body armor and may be employed in multiple layers arranged in superposed relation, either with or without a binding resin, to provide a structural material affording protection against a high energy particle, such as a projectile or fragments therefrom. The structural material has a high resistance to the penetration of a high energy particle in relation to its weight which is superior to the penetration resistance of a comparable structure of the same weight but including woven fabric layers of either glass fibers or nylon fibers alone. A hard outer surface plate of a ceramic material may be included as a component of the structural material in one embodiment thereof, enabling the structural material to successfully withstand the direct impact of certain types of projectiles thereagainst by preventing the penetration of these projectiles and thereby protecting personnel from injury and/or equipment from damage.

3,722,356

MACHINE GUN FEEDING MEANS

Douglas P. Tassie, St. George, and Burton P. Clark, Colchester, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed Sept. 28, 1970, Ser. No. 76,077
Int. Cl. F41d *9/02*
U.S. Cl. 89—11 **31 Claims**



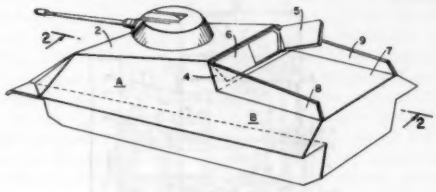
An article handling system, such as a machine gun, includes means to receive a series of articles progressively and continuously; means to distribute the articles to a plurality of work stations, to halt each article at a respective work station for a given period, and to withdraw the articles progressively and continuously.

3,722,357

ARMORED VEHICLE

Hans-Georg Schallehn, Kassel, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed Sept. 20, 1967, Ser. No. 670,021
Int. Cl. F41h *7/02*
U.S. Cl. 89—36 H **6 Claims**



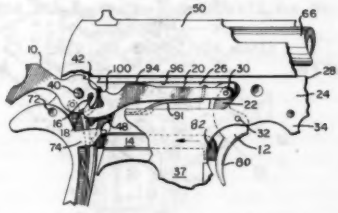
An armored vehicle having a forward personnel compartment which is lined with radiological shielding and an aft engine compartment, the latter having a lesser height than the former so that the personnel compartment has an upper aft wall portion whose height is equal to the difference between the personnel and engine compartments. This upper aft wall portion is provided with one or more doors through which personnel can leave the vehicle, while being protected, to the front, by the vehicle itself. Additional shielding is provided to protect the personnel, while on the top of the engine compartment, from the side.

3,722,358

COMBINED SINGLE AND DOUBLE ACTION FIRING MECHANISMS FOR PISTOLS AND KITS FOR CONVERTING SINGLE-ACTION PISTOLS

Louis W. Seecamp, 561 Whitney Avenue, New Haven, Conn.

Filed Jan. 14, 1971, Ser. No. 106,367
Int. Cl. F41c *19/14*
U.S. Cl. 89—147 **5 Claims**



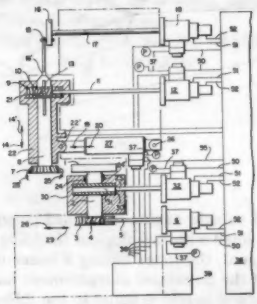
A double-action trigger mechanism for automatic pistols in which the firing mechanism of the original single-action design of pistols, such as the Government Model 1911, is retained and continues to function in the same way as before. Conversion of existing pistols is made feasible by providing a cocking link between the trigger and the hammer which is completely separate from the single-action sear mechanism, thereby retaining the same operation in firing the gun in single-action while adding double-action, that is, the capability of cocking and firing the gun by means of the trigger.

3,722,359

GEAR SHAPING APPARATUS

Joachim Hans, Hasenbergweg 12, Ettlingen/Baden; Hans Jorgen Ditschler, Albert-Braun-Str. 12f, Karlsruhe, and Gerhard Russeler, Ahornweg 4, Bruchhausen, Germany

Filed Aug. 30, 1971, Ser. No. 176,055
Claims priority, application Germany, Aug. 29, 1970, P 20 42 929.2
Int. Cl. B23f 1/04
U.S. Cl. 90—7 9 Claims



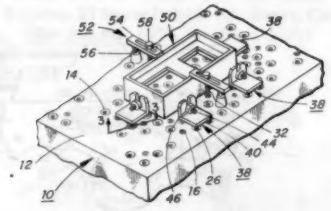
A gear shaping apparatus in which a work piece to be shaped into a gear and a cutting tool undergo relative rotational movement about their axes, reciprocating movement parallel to their axes, and engaging/disengaging motion whereby their axes move towards and away from each other. A separate continuously operable computer operated control device is provided for causing each of these movements, each of the control devices being operable mechanically independently of the others.

3,722,360

MEASURING AND LOCATING METHOD

Alexander G. Blakey; Jack S. Adams, and James J. Swarts, all of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 821,587, May 5, 1969. This application March 19, 1971, Ser. No. 126,023
Int. Cl. B23b 35/00, B23d 79/00
U.S. Cl. 90—11 C 20 Claims



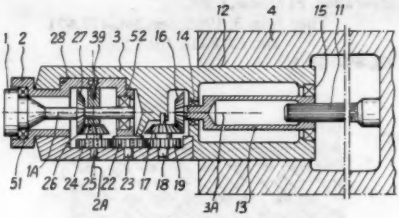
A method of using a measuring and locating system utilizing a novel surface plate and fixtures associated therewith is disclosed. Basically, a plurality of uniform recesses are formed in a surface. At least one ferromagnetic member having an exterior shape corresponding to the shape of the recesses is placed in a recess and secured to a measuring and/or locating fixture. Magnetic attraction means are provided adjacent to recesses to aid in holding ferromagnetic members in place. The fixture may be easily removed by overcoming the magnetic attraction forces and replaced in exactly the same position. This method is useful for dimensional measurement of workpieces, locating workpieces for automatic machining operations, etc.

3,722,361

UNIVERSAL MILLING SPINDLE-CARRYING UNIT

Albert Rinck, Viuz en Sallaz, France, assignor to Societe Anonyme Gambin S. A., Viuz en Sallaz, France

Filed June 28, 1971, Ser. No. 157,385
Claims priority, application France, July 16, 1970, 7026103
Int. Cl. B23c 1/12
U.S. Cl. 90—17 3 Claims



The invention relates to the universal milling units comprising a milling cutter-carrying spindle mounted in a head adapted to pivot in a fork-portion of a cylindrical body pivotally and longitudinally slidable in a bore of a support. The drive for rotating the milling cutter-carrying spindle is ensured from a power shaft coaxial with said body through a transmission which comprises, among others, a bevel gear secured to the milling cutter-carrying spindle and in mesh with a mating bevel gear which is carried by an intermediate shaft coaxial with the pivotal axis of the head .

In a known embodiment of this kind, the aforesaid transmission comprises an intermediate longitudinal shaft one end of which is operatively connected to the aforesaid mating bevel gear through a pair of bevel gears and the other end of which is operatively connected to the power shaft through a pair of cylindrical gears.

In order to avoid the detrimental effects of any torsion to which the intermediate longitudinal shaft is subjected, and also to avoid providing gears of relatively small dimensions such as the gears carried by the longitudinal intermediate shaft, a new structure is proposed in which such intermediate longitudinal shaft is eliminated. For this purpose, the remainder of the aforesaid transmission is constituted solely by a train of cylindrical meshing gears, the first of which is secured to a bevel gear in mesh with a bevel gear secured to the power shaft and the last of which is secured to the aforesaid mating bevel gear in mesh with the bevel gear secured to the milling cutter-carrying spindle.

3,722,362

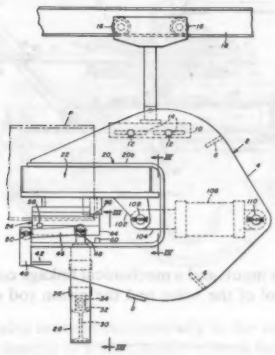
INSIDE PIPE BURR REMOVAL TOOL

Ralph W. Pitts, Pleasant Grove, and McKinley B. Thomas, Orem, both of Utah, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1971, Ser. No. 194,277
Int. Cl. B23d 1/16
U.S. Cl. 90—24 B 6 Claims

Tool includes a frame having a substantially U-shape opening adjacent one edge for receiving the wall of a welded pipe having an inside burr therealong. The tool is adapted to be suspended in vertical position from an overhead support for movement toward and away from the interior of the end of a pipe and includes a reciprocating tool carriage mounted in its U-shape opening. The carriage is attached to and powered by a pressure fluid cylinder, mounted on the frame, for movement along a way in the U-shape opening. A cutter projects from the tool carriage and is adapted to remove the burr when the tool carriage is moved from a position adjacent the open end of the U-shape opening to a position inwardly of the open end of the opening. A pair of fluid cylinder actuated shoes is

provided on the frame for engaging the outer contour of the pipe so as to clamp it between the pair of shoes and another pair of shoes which depend from the tool carriage and engage



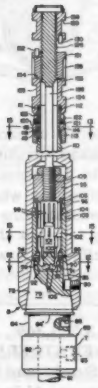
the inner contour of the pipe astride the burr. Thus the pipe is firmly held when the cutting tool is moved to cut away the end portion of the inside burr.

3,722,363

AUTOMATIC TOOL CHANGER

Robert Z. Hague, Oradell, N.J.; Edwin F. Hantman, New York, N.Y.; Howard H. Laucks, South Hackensack, N.J.; George J. Loos, Parsippany, N.J.; Matthew F. Marsicano, Forest Hills, N.Y., and Alfred J. Mastropole, Saddle River, N.J., assignors to Moog, Inc., East Aurora, N.Y.

Division of Ser. No. 821,361, May 2, 1969.
Filed Oct. 8, 1970, Ser. No. 79,262
Int. Cl. B23q *5/04*
U.S. Cl. 90—11 D **5 Claims**



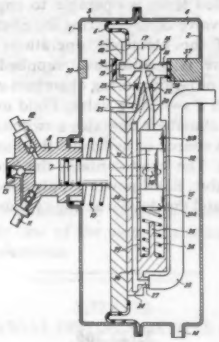
A tool changer is disclosed for automatically removing a working tool after having been used from the spindle of a machine tool such as a vertical milling machine, transferring the used working tool to a rack which stores a plurality of working tools, picking up from the rack another working tool for the next machining operation, transferring such new working tool to the spindle, and operatively mounting such new working tool on the spindle.

3,722,364

RECIPROCATING FLUID MOTOR

Philippe Durand, St. Denis, France, assignor to Societe Anonyme D.B.A.

Filed April 8, 1971, Ser. No. 132,373
Claims priority, application France, April 15, 1970, 7013576
Int. Cl. F15b *13/042*; F15c *1/10*
U.S. Cl. 91—3 **4 Claims**



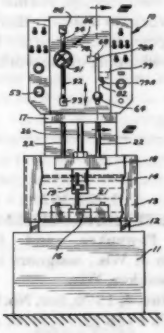
A reciprocating fluid motor, notably for operating a pump comprising an enclosure divided into two pressure chambers by a movable wall, said movable wall experiencing a forward stroke and a return stroke and being resiliently urged towards the return position, a control device responsive to the position of the movable wall controlling a distributing valve to alternately communicate one of said pressure chambers with a high pressure equalling the pressure residing at all times in the other chamber, and with a lower pressure. In this motor the control device and the distributing valve are mounted within the thickness of the movable wall, and the control device is a fluidic flip-flop. If air is selected as energizing fluid for the motor, the high and low pressures can be the atmospheric pressure and the vacuum created in the intake manifold of an engine respectively.

3,722,365

HYDRAULIC PRESSURE APPARATUS

Sven O. Olsson, Edina, Minn., assignor to Essar Corporation, Minneapolis, Minn.

Division of Ser. No. 96,024, Dec. 8, 1970, Pat. No. 3,662,142, which is a division of Ser. No. 819,006, April 24, 1969, Pat. No. 3,604,884. This application Feb. 14, 1972, Ser. No. 225,842
Int. Cl. F15b *21/04*; F01b *25/26, 31/12*
U.S. Cl. 91—4 A **10 Claims**



An electrical discharge machining device or EDM machine having a head carrying an electrode which is movable toward

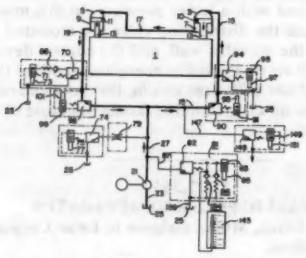
and away from a work piece by a hydraulically operated double acting cylinder. A control valve, combined with a servo solenoid and manually operated lever, is operable to control the flow of hydraulic fluid to the cylinder. A light responsive electrical control operates the servo solenoid in response to the size of the electrical discharge gap between the electrode and the work piece. Interposed in the fluid line to the hydraulic cylinder is a lock valve operable to lock the cylinder and fix the position of the electrode relative to the work piece. The manually controlled lever is operable to engage switches to override the lock valve control during the electrical machining and elevation of the electrode operations of the device. Hydraulic pressure is continuously supplied to the control valve from a pair of liquid storing chambers connected to the control valve with a switching valve. Fluid under pressure in either one of the chambers operates a switching valve to provide a continuous source of hydraulic fluid under pressure to the control valve. The head contains the hydraulic pressure source, control valve, EDM power supply, electric control circuit for the valve and the double acting cylinder.

3,722,366

PRECISION ANTI-WHIP RAM TYPE MACHINE

Rolland A. Richardson, Alameda, Calif., assignor to Pacific Press & Shear Corporation

Filed March 22, 1971, Ser. No. 126,671
Int. Cl. F15b *11/16*
U.S. Cl. 91—170 R **14 Claims**



A hydraulically powered ram type machine employing series connected hydraulic drive motors, drives the ram at faster than normal speed, then through normal speed following engagement with the work, to a slower than normal speed sufficient to assure extreme accuracy in air bending, and, at the same time, preclude whipping of the work.

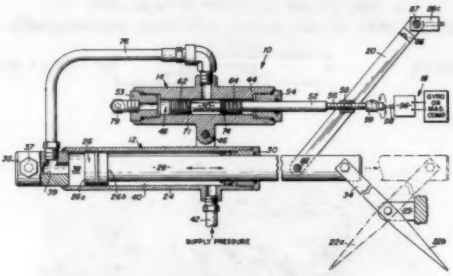
3,722,367

STEERING SYSTEM

Raymond Clark, Pewaukee, and Dale A. Knutson, Oconomowoc, both of Wis., assignors to Applied Power Industries, Inc., Milwaukee, Wis.

Filed Nov. 4, 1970, Ser. No. 86,783
Int. Cl. F15b *13/16, 9/10, 15/17*
U.S. Cl. 91—367 **5 Claims**

This invention relates to a power system for accurately moving and holding a relatively large load with relatively small and sensitive power inputs. The system includes a power cylinder, a control valve pivotally mounted thereto, a steering push-pull



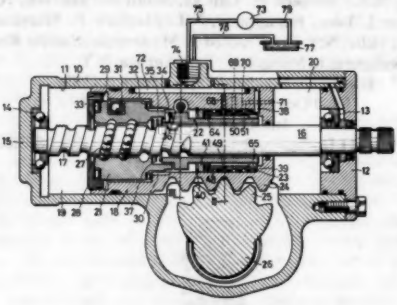
cable or rotary input, and a mechanical linkage connecting the input, the spool of the valve and the piston rod of the power cylinder.

3,722,368

FLUID POWER STEERING UNIT

Hideki Suzuki, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed June 1, 1971, Ser. No. 148,536
Claims priority, application Japan, June 4, 1970, 45/55030
Int. Cl. F15b *9/10*
U.S. Cl. 91—375 R **6 Claims**



An integral power steering apparatus for the vehicle in which a fluid power piston meshing with a gear sector mechanically connected to the pitman arm accommodates a rotary valve member therewithin which will be actuated to rotate by rotation of a manual steering shaft for controlling the hydraulic pressure supply to assist the piston advancement, whereby a compact and effective power steering unit may be obtained.

3,722,369

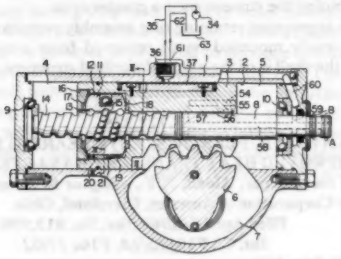
FLUID POWER STEERING GEAR

Tadashi Maekawa; Akira Suzuki, and Shigenori Haramura, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi-ken, Japan

Filed Feb. 12, 1971, Ser. No. 114,864
Int. Cl. F15b *9/0*
U.S. Cl. 91—380 **8 Claims**

A fluid power steering gear is comprised of a piston installed in a cylinder and defining a pair of opposed fluid chambers therewithin, the piston being formed with rack teeth which are in mesh with the teeth of a gear sector linked to the front wheels of a motor vehicle. A steering nut is rotatably confined in this piston and is operably connected, via a plurality of

endlessly recirculating balls, to a steering shaft. A pair of control valve means, respectively in communication with the aforesaid opposed fluid chambers on both sides of the piston, are also installed in the piston so as to be respectively operated



by means of pins secured eccentrically to the end face of the steering nut, thereby to interrelatedly control fluid flow to and from the fluid chambers. A safety device for operation in the event of a malfunction of the fluid power steering gear is also provided.

3,722,370

HYDRAULIC WHEEL MOTOR UNIT

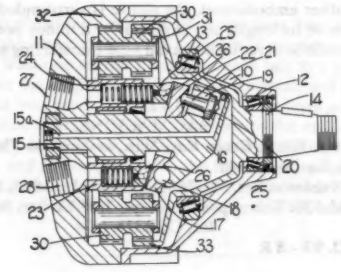
Neville Frederick Aplin, 3 Gleneagles Drive, Southport, England

Filed March 23, 1971, Ser. No. 127,121

Claims priority, application Great Britain, March 31, 1970, 15,156/70

Int. Cl. F01b *13/06*

U.S. Cl. 91—506 **5 Claims**



A wheel drive unit includes a housing including an end plate on which there is a spigot. The spigot carries a cam plate for an axial piston type rotor journalled on the spigot. The unit has an output shaft coaxial with the spigot and this shaft is driven by the rotor through an epicyclic reduction gear of which external teeth on the rotor form the sun pinion.

3,722,371

HIGH RATIO LINKAGE MECHANISM

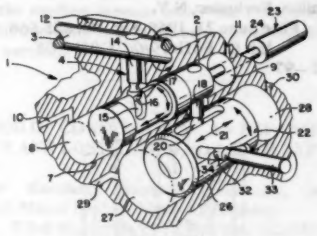
Robert F. Boyle, Kalamazoo, Mich., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed March 12, 1970, Ser. No. 19,038

Int. Cl. F01b *25/26, 31/12*; **F15b** *9/10*

U.S. Cl. 92—5 R **9 Claims**

Linkage mechanism comprises a close coupling between two or more elements in the form of a drive member having one end fixed to one of the elements and the other end acting in an angled slot in the other element to obtain a high ratio of



travel between elements. A position-indicating device attached directly to one of the elements accurately senses the position of both elements.

3,722,372

HYDRAULIC AXIAL PISTON MACHINE OF THE BENT-AXIS TYPE

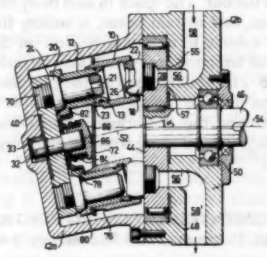
Lennart Werner Freese, Jarfalla, Sweden, assignor to General Electric Company

Filed March 26, 1971, Ser. No. 128,257

Claims priority, application Sweden, April 3, 1970, 4598/70

Int. Cl. F01b *13/06*

U.S. Cl. 91—504 **8 Claims**



A hydraulic or pneumatic so called bent-axis piston machine is provided which comprises a number of parallel cylinders arranged equally spaced about a common axis, each cylinder slidably and telescopically receiving a piston in the form of a sleeve forming together with its cylinder a piston-cylinder assembly whose opposite ends engage spherical convex seats provided on respective rotatable support bodies or drive plates, said bodies or plates forming an angle with one another in the manner known in bent-axis machines. Each cylinder and piston is resiliently held in engagement with its cooperating seat by means of a spring-actuated expander device tending to bring each of the piston-cylinder assemblies to extend in order that their seating engagement is maintained. One of the support bodies or drive plates may also be made adjustably slidable in a lateral direction so as to vary the bent-axis angle and thus the displacement of the machine.

ERRATUM

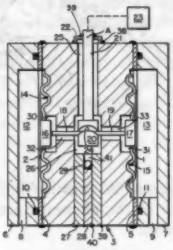
For Class 92—5 R see:
Patent No. 3,722,371

3,722,373

DIFFERENTIAL PRESSURE RESPONSIVE DEVICE OF WELDED CONSTRUCTION

Richard G. Beach, Greece; Harry Stultz, Jr., Chili, and Symonds, James A., Penfield, all of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed June 23, 1969, Ser. No. 835,566
Int. Cl. F01b *19/00;* **G01l** *7/08*
U.S. Cl. 92—97 **3 Claims**



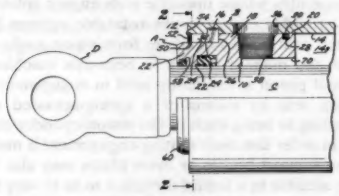
A differential pressure responsive device including a body of metal and a pair of metal diaphragms welded around their peripheries to opposite sides of the body. A first bore in the body interconnects the adjacent sides of the diaphragms and receives a connector mechanically interconnecting the diaphragms. A second bore through the body is closed at one end by a third metal diaphragm welded around its periphery to the body. The other end of the bore is closed by a plug assembly. The second bore passes through the first bore and has a rigid bar therein connected at one end to said connector and passes out thereof through said third diaphragm, which is welded to the bar. The space in said body between said pair of diaphragms, and in said bores, is solidly filled with liquid in sufficient volume to maintain tension on the connector over the range of temperatures which may be encountered in use of the device. Flanges clamped to the peripheries of the pair of diaphragms provide for applying pressures to same. Between the flanges and the diaphragm peripheries is sandwiched a welding ring, welded along with the diaphragms to the body.

3,722,374

SEGMENTED RETAINING RING ASSEMBLY

Richard M. Densmore, 933 McNearney Avenue, South Gate, Calif.

Filed June 14, 1971, Ser. No. 152,660
Int. Cl. F01b *29/00*
U.S. Cl. 92—128 **5 Claims**



A segmented retaining ring assembly, in which each segment has a generally L-shaped transverse cross section. Each segment includes first and second normally disposed legs, with the first leg when disposed in a first circumferentially extending groove in a cylindrical shell defining an abutment surface, and the second leg when positioned in a second circumferentially extending groove formed in an end piece assembly serving as an appendage for evenly distributing forces in a radial direction to the shell. The end piece assembly reduces the per unit stress on the shell as the former tends to separate from the latter due to a positive pressure within the confines of the shell. This reduction in per unit stress over prior art means of securing an end piece to a cylindrical shell is achieved by distributing the stresses over a greater area.

The segmented retaining ring assembly permits an end piece to be easily mounted on or removed from a cylinder shell, when the shell is of the above described structure.

3,722,375

SYNTHETIC PLASTIC SLEEVE BEARING HAVING IMPROVED HEAT TRANSFER CHARACTERISTICS

Ward Sievenpiper, Alden, N.Y., assignor to Automatic Sprinkler Corporation of America, Cleveland, Ohio

Filed April 7, 1969, Ser. No. 813,990
Int. Cl. F16j *15/18;* **F16c** *27/02*
U.S. Cl. 92—168 **8 Claims**

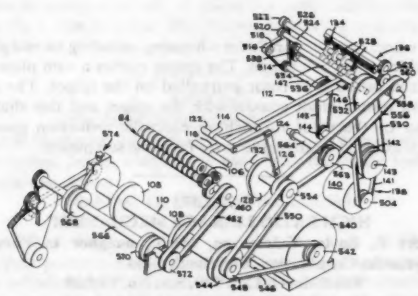
A sleeve bearing of synthetic plastic material wherein the inner and outer bearing surfaces are entirely of the plastic material. A heat conducting, reinforcing element, preferably a perforated metal sleeve, is fixed within the plastic bearing. In one embodiment, the metal sleeve is surrounded by the synthetic plastic material over its entire axial length and is exposed at one end to provide an axial heat transfering surface. In another embodiment, the sleeve is surrounded for a major portion of its length and exposed for a minor portion thereof to provide both radial and axial heat transferring surfaces.

3,722,376

BAG MACHINE

Robert J. Wech, Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 760,048, Sept. 16, 1968, Pat. No. 3,663,338. This application Sept. 1, 1971, Ser. No. 176,901
Int. Cl. B31b *1/94*
U.S. Cl. 93—8 R **5 Claims**



The bag machine of the present disclosure is of the type which can produce bags made of various thermoplastic sheet

material and can be adapted to make side weld or bottom weld bags. The following description will, however, be confined to the production of side weld bags.

A roll of plastic web is mounted on an unwind stand and traverses a folding board constraining the web to fold along its longitudinal median or along a line spaced from and parallel to the longitudinal median in the event it is desired to produce wicketed bags having a lip with a pair of holes in which is inserted a U-shape wire called a wicket. Downstream of the folding board a gusseter is provided to produce a fold which permits greater expansion at the bottom of the bag. The folded and gusseted web thence comes under the influence of a reciprocating transversely disposed seal and cutter bar which divides the web, at longitudinally spaced intervals, to produce individual bags. The bags are then transported to a table which is provided with devices for arranging the bags into a stack.

3,722,377

BAGS

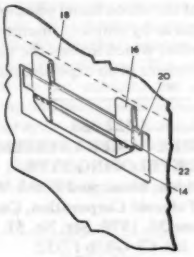
Arthur William Hayes, Port Elizabeth, Republic of South Africa, assignor to P & B Agencies (Proprietary) Limited, Port Elizabeth, Cape Province, Republic of South Africa

Filed Oct. 1, 1970, Ser. No. 77,152

Claims priority, application Republic of South Africa, Oct. 8, 1969, 69/7084

Int. Cl. B31b *49/04*

U.S. Cl. 93—35 H **9 Claims**



A method of making a plurality of carrier bags from a length of bag-making material including the steps of providing on the material at least one carrier handle for each bag in a position transverse to the longitudinal axis of the material, and cutting the material into predetermined lengths along lines adjacent to the handles, characterized in that prior to the cutting step each handle is folded back on itself away from the cutting line adjacent it, and releasably held in the folded-over position by means of strips weakly bonded across the folded over handles, or glue spots or inserts of malleable metal provided across the fold-lines.

3,722,378

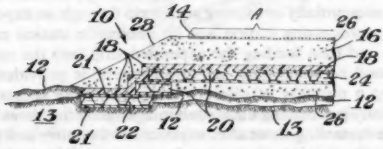
INSULATED TRAFFICKED SURFACES

John S. Best, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 4, 1971, Ser. No. 112,635

Int. Cl. E01c *9/00*

U.S. Cl. 404—31 **21 Claims**



Trafficked surfaces built on foundations which remain substantially undisturbed during seasonal climatic cycles, particularly in permafrost and near permafrost regions where considerable disturbance of the ground beneath foundations is otherwise common. The foundations include combinations of insulation layers, heat sinks and/or thermal bleeds which dampen and prevent the cyclic climatic seasonal variations from affecting the earthen support under the foundations, in both cut and fill sections, and in embankments and backfills adjacent the sections.

3,722,379

METHOD OF CONSTRUCTING AN EXPANSION GAP DEVICE AND LOST CASING FOR SUCH EXPANSION GAP

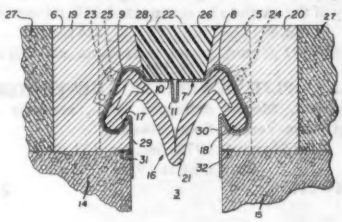
Waldemar Koester, Forshach, Germany, assignor to Friedrich Mauer Soehne, Munich, Germany

Filed March 10, 1971, Ser. No. 122,788

Claims priority, application Germany, Sept. 19, 1970, P 20 46 400.0

Int. Cl. E01c *11/10*

U.S. Cl. 404—68 **24 Claims**



The present invention relates to a method of constructing an expansion gap between two structural members such as concrete slabs in roads or on bridges. First the concrete slabs are formed with a gap between two adjacent slabs whereupon a surface layer is applied to the slabs to cover the slabs as well as the gap. Thereafter, a recess is formed in the surface layer above the gap but wider than the gap. A lost casing is then inserted into the recess and gap and the space laterally adjacent to the lost casing is filled with a synthetic resin concrete. When the concrete is set, a cross portion of the lost casing which bridges the gap is removed, for example by sawing. An elastic sealing body or strip is inserted either as a unit with the lost casing or it is snapped into position, after said cross portion has been removed, in recesses formed by said lost casing in the synthetic resin concrete. The lost casing is a downwardly open profile with shaped side members for forming said recesses and interconnected by said cross portion.

3,722,380

VIBRATING ROLLER EARTH COMPACTOR

Benno Kaltenegger, Kurhausstr. 77-79, Hennef, Germany

Filed Dec. 15, 1970, Ser. No. 98,329

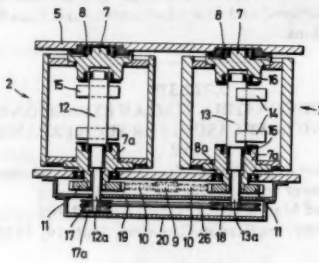
Claims priority, application Germany, Jan. 17, 1970, P 20 01 988.9

Int. Cl. E01c *19/28*

U.S. Cl. 404—117 **25 Claims**

An earth compactor of the roller type having first and second rollers one behind the other in the direction of travel of the compactor, a vibrator for vibrating the first roller at a first frequency, and a vibrator for vibrating the second roller at a second frequency. The vibrators take the form of eccentrically mounted weights on shafts rotatable at different speeds along the axes of the respective rollers. In one embodiment the eccentric weights and the rollers each have the same size and mass. In another embodiment the slower rotating eccentric weights have a greater mass than the more rapidly rotating weights. In an additional embodiment, the slower

rotating heavier weights vibrate a roller of greater mass than the roller vibrated by the smaller mass faster rotating weight. The rollers are mounted on a rigid frame for rotation and the effect of vibrating the rollers with vibrators operating at different constant frequencies is to vibrationally impact the rollers against the ground in a band of frequencies to insure uniform compaction of the ground regardless of variations in consistency of the earth to be compacted.

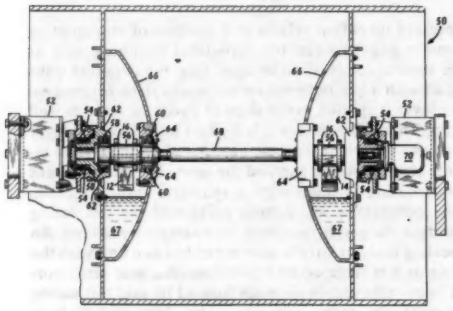


3,722,381

DUAL AMPLITUDE VIBRATION GENERATOR

Eskil Tuneblom, Mount Arlington, N.J., assignor to Aktiebolaget Vibro-Verken, Solna, Sweden

Filed March 4, 1971, Ser. No. 121,036
Int. Cl. E01c *19/28*
U.S. Cl. 404—117 **2 Claims**



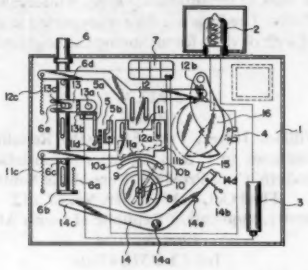
A dual amplitude vibratory mechanism has a pair of eccentric weights mounted on a shaft in such a way that a different amplitude of vibration can be had simply by reversing rotation of the shaft. One of the weights is attached to the shaft and rotatable with it, while the other weight is mounted on the shaft but freely rotatable relative to it. Each weight has a pair of contact surfaces that cooperate with similar surfaces on the other weight, so that when the shaft rotates one of the surfaces on the fixed weight engages the cooperating surface on the free weight, which results in both weights revolving as a single composite eccentric weight, thereby causing the shaft to vibrate. When the shaft rotation is reversed, the other surface on the fixed weight engages its cooperating surface on the free weight, and the weights revolve in that direction as a single composite eccentric weight. The weights are shaped and dimensioned such that they have a combined center of gravity relative to the shaft when one set of surfaces engage each other that is different from the center of gravity when the other surfaces are in engagement, thereby resulting in a different amplitude of vibration when rotation of the shaft is reversed.

3,722,382

DEVICE FOR OPERATING A FLASH CIRCUIT IN AN AUTOMATIC FLASH CAMERA

Tatsuo Kobayashi, Kaizuka-shi; Maki Yamashita, Toyokawa-shi, and Hideo Takeuchi, Gamagori-shi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Osaka, Japan

Filed Sept. 24, 1969, Ser. No. 860,749
Claims priority, application Japan, Sept. 30, 1968, 43/84216
Int. Cl. G03b *7/12*
U.S. Cl. 95—10 C **3 Claims**



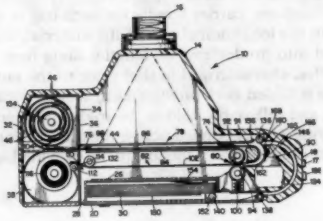
A device which actuates a flash circuit in a camera whenever the brightness of the scene being photographed is too low for the taking of pictures by ambient illumination. A switch is arranged on the member which arrests the needle pointer of a conventional galvanometer in an exposure meter circuit.

3,722,383

UNIQUE WASTE-FREE CAMERA SYSTEM OF THE SELF-DEVELOPING TYPE

David Van Allen, Malden, Mass., and Frank W. Knight, Salem, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 30, 1970, Ser. No. 51,191
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **20 Claims**



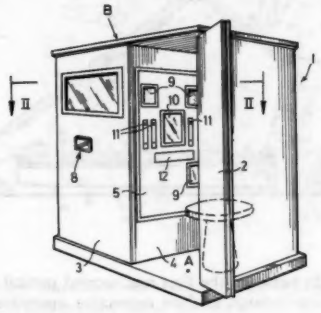
A self-developing type camera adapted to removably receive a two-section cassette. An elongated strip of photographic materials including alternately spaced photosensitive image-recording sheets and process fluid containing pod assemblies is initially housed within the first section of the cassette. An arrangement is provided in the camera for progressively withdrawing the elongated strip from the cassette's first section, sequentially advancing such strip through an exposure station, a processing station and an imbibition station of the camera, and then feeding the expended strip into the cassette's second section. Also, an arrangement is provided for mounting a plurality of discrete image-receiving sheets and sequentially positioning each such image-receiving sheet over an image-recording sheet after exposure of the latter and prior to its introduction into the camera's processing station. A door on the back of the camera facilitates the removal of each image-recording sheet after completion of the processing operation.

3,722,384

AUTOMATIC COIN OR TOKEN OPERATED APPARATUS FOR TAKING AND DEVELOPING PHOTOGRAPHS

Luigi Chiesa, Torino, Italy, assignor to Morenar S.A., Fribourg, Switzerland

Filed May 21, 1971, Ser. No. 145,727
Claims priority, application Italy, May 23, 1970, 68776 A/70
Int. Cl. G03b *17/50*
U.S. Cl. 95—14 9 Claims



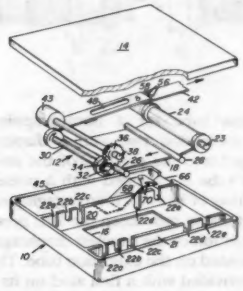
A coin or token operated photographic apparatus is of the type having a cubicle for a person to be photographed and adapted to automatically develop, reverse and fix the photograph and then deliver it to the user. The apparatus comprises a cabinet adjacent to the cubicle, the cabinet containing developing, reversing and fixing baths arranged in a circle, and the pieces of photographic paper are put automatically into individual small baskets pivoted on the ends of radial arms supported by a hub plate, the hub plate being intermittently rotated, lowered and raised again to immerse each basket in turn in each bath.

3,722,385

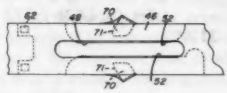
COMBINED FILM PACK AND STRIP METERING MECHANISM FOR ADVANCING FILM

Leonard F. Kamp, Rochester, and William P. Ewald, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 24, 1971, Ser. No. 156,252
Int. Cl. G03b *19/04*
U.S. Cl. 95—22 19 Claims



A film pack having a strip metering mechanism for advancing a roll of film in predetermined increments or steps for use in a camera of the instant processing type which receives conventional film packs and does not have a film roll advancing facility. The metering mechanism comprises a metering strip coupled to a roll of film and having a leader extending out of the camera which when manually pulled advances the film successive predetermined lengths or increments for exposure. The metering strip comprises interleaved pull tabs having their leading and trailing ends sealed together in overlapped relation. The film pack or camera is provided with a severing



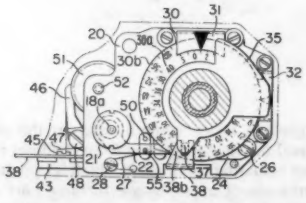
mechanism for at least partially severing the seal between the trailing and leading ends of the pull tabs, and thereby sufficiently weakening the seal to cause the leading pull tab to detach from the succeeding pull tab at the instant that the film has been advanced to locate a predetermined increment of film in a correct exposure position.

3,722,386

FRAME COUNTER FOR CAMERAS

Koichi Furuta, Tokyo, Japan, assignor to Nippon Kogaku K.K., Chuo-ku, Tokyo, Japan

Filed May 3, 1971, Ser. No. 139,624
Claims priority, application Japan, June 9, 1970, 45/49139
Int. Cl. G03b *1/66*
U.S. Cl. 95—31 DS 5 Claims



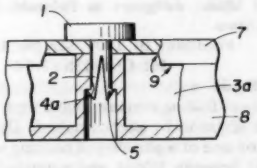
A frame counter for cameras of the type provided with an automatic return film counter, which can display the number of photographed frames for either ordinary film having a thickness of 0.14 mm, and thin film having a thickness of the order of 0.07 mm, thereby enabling any of these different films to be used with the cameras.

3,722,387

CARTRIDGE ESPECIALLY FOR FILM

Bernhard Walther, Dessau, Germany, assignor to VEB Filmfabriken, Wolfen, Germany

Filed July 12, 1971, Ser. No. 161,808
Int. Cl. G03b *19/04*
U.S. Cl. 95—31 R 5 Claims

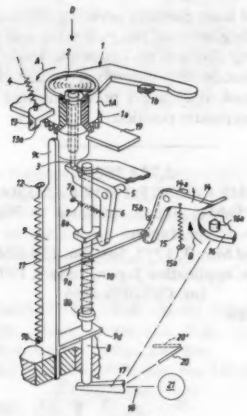


The outer wall of a cartridge containing photographic film or the like is combined with, or assembled with the aid of, at least one indicator pin. The head of the pin is so shaped, or otherwise so arranged, as to cause selective responses, dependent on the contents of the cartridge. The pin structure is fastened by resilient action.

3,722,388
SINGLE-LENS REFLEX CAMERA

Alfred Winkler, Munich, Germany, assignor to Agfa-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 23, 1971, Ser. No. 182,984
Claims priority, application Germany, Sept. 25, 1970, P 20 47 363.4
Int. Cl. G03b *19/12*
U.S. Cl. 95—31 AC **17 Claims**



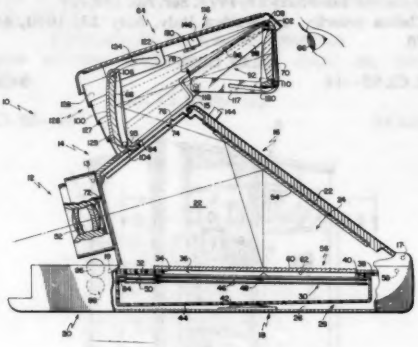
A single-lens reflex camera wherein the shutter can be opened and the mirror pivoted from the light reflecting position by an actuating mechanism which is operated in response to deformation of a diaphragm forming part of the release device. The diaphragm is mounted in the cylindrical hub of a rapid film transport lever and can operate the actuating mechanism by way of a pin which is coaxial with the lever, a blocking lever and a spring biased rod. The rod can be retracted to its normal position to allow for resetting of the actuating mechanism by a spring-biased member which is cocked by the film transport lever and uncocked by a cam upon completed operation of the actuating mechanism to thereby automatically return the rod to its normal position in which the rod is held by the blocking lever.

3,722,389
FOLDING CAMERA

Peter F. Costa, Winthrop, and Edward H. Coughlan, Canton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 10, 1971, Ser. No. 141,554
Int. Cl. G03b *17/04*
U.S. Cl. 95—39 **39 Claims**

A compact folding camera including a viewing device for framing a scene to be photographed. The viewing device is mounted on one of a plurality of housing sections coupled for movement between folded and extended positions, and includes first and second optical elements, operatively associable for providing an image of the scene. The optical elements are mounted for movement relative to one another between operative viewing positions and inoperative storage positions. At least one of the optical elements is adapted to be moved between its inoperative and operative positions in response to movement of the housing sections between the folded and extended positions. A collapsible shade cooperates with other components of the viewing device to reduce the admission of

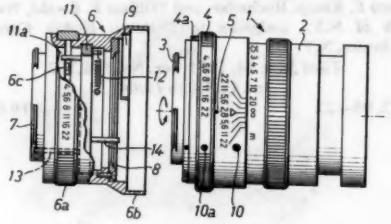


ambient light between the first and second optical elements when they are located in their respective operative viewing positions.

3,722,390
EXTENSION TUBE FOR PHOTOGRAPHIC LENSES

Werner Schlapp, Asslar, and Otto Boss, Naunheim, both of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Feb. 15, 1972, Ser. No. 226,467
Claims priority, application Germany, Feb. 25, 1971, P 71 70 072.9
Int. Cl. G03b *3/00*
U.S. Cl. 95—45 **3 Claims**

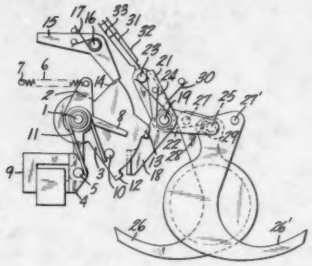


An extension tube for a photographic lens having a diaphragm preselection ring and a diaphragm blade ring resiliently urged into the position of the smallest diaphragm aperture. The tube is provided with a preselection ring and with an inner ring of its own. Interengaging means on the lens and on the extension tube keep the lens preselection ring arrested in its position of the smallest diaphragm aperture when the lens is mounted on the extension tube. The extension tube inner ring is provided with a first stud on its front and with a second stud on its rear, both studs extending in axial direction. The front stud engages the lens diaphragm blade ring and the rear stud engages the camera diaphragm lever so that the action of the camera diaphragm lever is transmitted through the extension tube to the lens diaphragm blade ring and the diaphragm preselection operation of the lens is maintained when the extension tube is inserted between the lens and the camera body.

3,722,391
ACTUATING MECHANISM FOR AN ELECTRICALLY CONTROLLED SHUTTER

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed April 30, 1971, Ser. No. 139,128
Claims priority, application Japan, May 1, 1970, 45/36855
Int. Cl. G03b 7/08, 9/08, 9/58
U.S. Cl. 95—53 EB 5 Claims

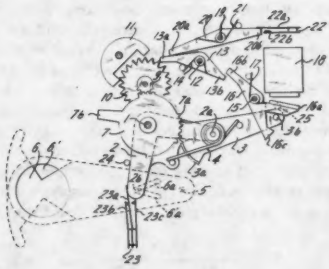


A camera and shutter in which the shutter exposure time is controlled by a control circuit and the shutter blades are actuated to an open position from a closed position back to the closed position by a mechanism actuated in one direction of movement. The mechanism is reversed in direction only when the shutter is cocked. Two springs cooperate in controlling the movement of a driving plate in one direction. One spring rotates the plate and the other rotates an intermediate control member that stops the driving plate in a shutter-opening position and then is released by the time delay control circuitry of the control circuit so that it allows the driving plate to move under control of its spring in the same direction in closing the shutter that it travelled in opening the shutter.

3,722,392
CAMERA SHUTTER WITH NOVEL OPERATING MECHANISM

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Tokyo, Japan

Filed June 7, 1971, Ser. No. 150,612
Claims priority, application Japan, June 5, 1970, 45/48047
Int. Cl. G03b 7/08
U.S. Cl. 95—62 10 Claims

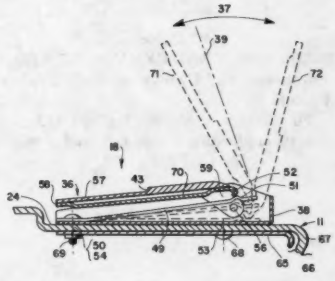


A camera shutter operating mechanism controlled by a light-responsive control circuit and having a retarder retarding the opening of the shutter blades by a blade-operating lever driven by a driving lever and configured as a sector gear at one end driving a retarder gear coactive with a gear of an escapement having an anchor jointly functioning as the retarder. The driving lever is pivotally mounted intermediate a free end of the operating lever and the sector gear thereon. A drive spring biases the driving lever in a direction for effecting opening and closing of the shutter blades. A pawl is attracted by an electromagnet of the control circuit and this pawl restrains the free end of the driving lever during part of the period of rotation of the driving lever while the shutter blades are being opened and thereafter the driving lever rotates the shutter blade-operating lever in a direction for closing the shutter blades quickly free of the retarding of the retarder when the electromagnet is de-energized by the control circuit after termination of an exposure, the exposure time of which is determined automatically as a function of the brightness of the field or object being photographed.

3,722,393
PORTABLE CAMERA SUPPORT DEVICE WITH AIMING STRUCTURE

Nolan A. Drevitch, Norwood, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 28, 1970, Ser. No. 101,595
Int. Cl. G03b 17/56
U.S. Cl. 95—86 7 Claims



Support for removably mounting a portable camera. Aiming movement structure for the camera provided in the support about two orthogonally disposed axes. At rest location and situation for the camera on the support providing free use of both hands by camera operator. Support collapsible to storage when not in use. Suitcase storage for camera. Suitcase with built-in identification photograph treatment capability: timing, laminating, cutting, sealing. Console presentation for operation of these capabilities. At rest situation of the camera favorable to film loading and removal.

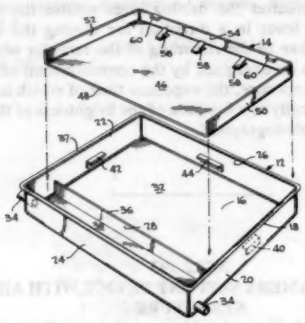
3,722,394
DEVELOPING AND WASHING TRAY

Paul J. Sebastian, 2072 Pine Drive, Lancaster, Pa.

Filed Jan. 11, 1972, Ser. No. 217,027
Int. Cl. G03d 1/04
U.S. Cl. 95—95 12 Claims

A developing and washing tray assembly comprising a receptacle having a peripheral wall and an intermediate partition wall defining below the peripheral wall adjacent compartments, one containing a fixing or developing solution, and the other compartment continuously draining or holding a top tray element in a position of non-use. The top tray being three-sided and normally supported in an overlying position to the

compartment containing the solution when in use with the open side of the top tray draining into the drainage compartment and being inclined to continuously drain therein. The



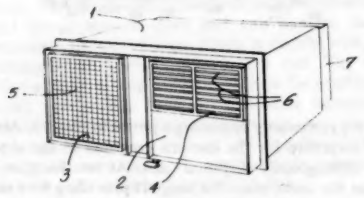
top tray including a handle to facilitate lifting, and a clamp to secure a sheet element being rinsed. The overlying top tray substantially preventing dilution of the developing or fixing solution as the treated sheet element is being rinsed.

3,722,395

COMBINED INTAKE AND EXHAUST VENTILATOR

Germain Courchesne, 167 Chemin du Golf, Drummondville, Quebec, Canada

Filed July 9, 1968, Ser. No. 743,423
Claims priority, application Canada, Aug. 3, 1967, 997058
Int. Cl. F24f *13/04*
U.S. Cl. 98—33 **3 Claims**



This invention concerns a combined intake and exhaust ventilator in which any proportion of exhaust air may be recirculated into the room.

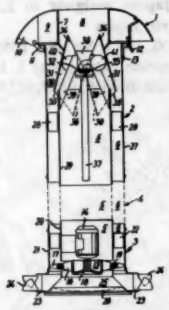
3,722,396

SYSTEM FOR THE VENTILATION OF BUILDINGS

Jurgen Eberhardt Peill; Alf Gerritse; Miroslav S. Osmera, all of Canning, N.S., Canada, and Christian Karmark Andersen, Naestved, Denmark, assignors to Nordisk Ventilator Co. Aktieselskab, Naestved, Denmark

Filed Nov. 9, 1971, Ser. No. 197,059
Claims priority, application Canada, Nov. 16, 1970, 98,212
Int. Cl. F24f *7/06*
U.S. Cl. 98—33 R **10 Claims**

A system for the ventilation of buildings, comprising vertical and concentrical exhaust and injection ducts extending from a fan section located in the room to be vented through a damper section comprising adjustable dampers for controlling the ventilation, to a roof hood comprising an outer wall and a partition dividing said roof hood into two separate outlet spaces, one for each duct, said outer wall and partition being made of a plastic material and being proportioned so as to be packable together with said fan section and damper section,



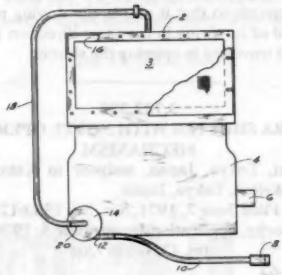
respectively, when shipping said ventilation system. The roof hood may be manufactured by pouring at least said partition from a plastic foam.

3,722,397

HOPPER DUST HOOD

Richard L. Kempthorne, 5701 Bayview Dr., Ft. Lauderdale, Fla.

Filed April 19, 1971, Ser. No. 136,277
Int. Cl. B65g *3/18*
U.S. Cl. 98—115 R **3 Claims**



A dust removal hood for a portable hopper that receives fibers to be agitated, and fed in a generally uniform mixture through the conduit to a spray nozzle. The dust removal hood collects and transfers the rising fiber dust from the hood area to the spray nozzle. The hood includes a trough or conduit along the top of the hood adjacent the hood opening. A conduit is connected between the hood trough and the intake of the hopper blower. The hopper blower transfers the dust through a transfer hose leading from the hopper to the spray nozzle in order to eliminate dust in the atmosphere and to utilize the fiber dust by discharging the fiber dust into the spray nozzle.

3,722,398

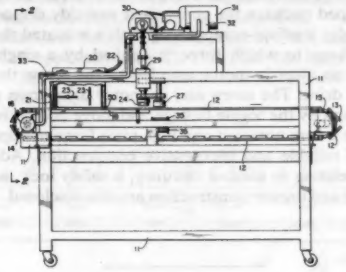
APPARATUS FOR PRODUCING CEREAL BISCUITS

James D. Freye, Cary, and Jeffrey G. Poat, Schaumburg, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 22, 1971, Ser. No. 117,292
Int. Cl. A23b *9/00*; A23l *1/10*
U.S. Cl. 425—204 **1 Claim**

An apparatus is disclosed for producing cereal biscuits or the like. The apparatus includes an endless conveyor comprised of a plurality of equal sized plates having openings from

top to bottom thereof and which move over a platform thus forming open top containers with means included for filling



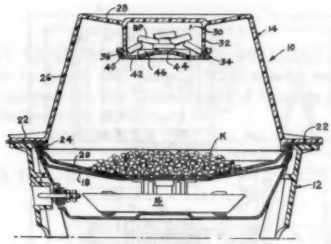
the thus formed open top containers, compressing the filling therein, and removing the compressed mixture from the openings.

3,722,399

POPCORN POPPER HAVING AUTOMATIC BUTTERING MEANS

Joseph E. Cole, Cheshire, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed April 23, 1971, Ser. No. 136,892
Int. Cl. A23l *1/18*
U.S. Cl. 99—323.8 **4 Claims**



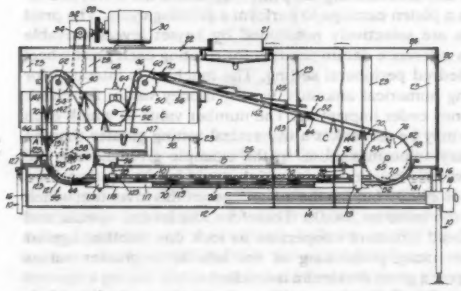
Popcorn popper has cover with butter-receiving support. Temperature at end of popping melts butter which passes through apertures in support to drip over popped corn.

3,722,400

TACO SHELL FRYER

James A. Jimenez, 6252 North Hart, Temple City, Calif.

Filed July 16, 1970, Ser. No. 55,486
Int. Cl. A47j *37/12*
U.S. Cl. 99—353 **13 Claims**



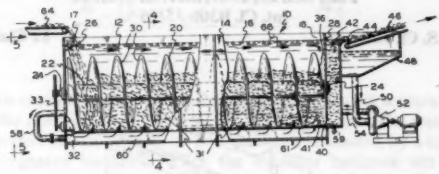
An apparatus for preparing taco shells from uncooked tortillas comprising a cooking vessel for containing cooking oil, a plurality of expandable taco shell forming means for holding the tortillas during cooking, spaced guide members disposed within the cooking vessel and arranged so as to frictionally engage the taco shell forming means, a conveyor for moving taco shell forming means between the spaced guide members and means cooperating with the taco shell forming means to free the cooked taco shell therefrom.

3,722,401

APPARATUS FOR PROCESSING EDIBLE FOODSTUFFS

Arthur R. Davidson, Lake Oswego, Oreg.; John E. Haubner, Vancouver, and George A. White, Quincy, both of Wash., assignors to Lamb-Weston, Inc., Portland, Oreg.

Division of Ser. No. 730,087, May 17, 1968, Pat. No. 3,642,495. This application Sept. 13, 1971, Ser. No. 180,046
Int. Cl. A47j *37/12*
U.S. Cl. 99—407 **7 Claims**



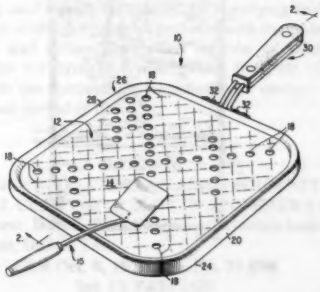
An apparatus for processing edible foodstuffs having a cylindrical casing and a screw conveyor coaxially disposed within the casing for transporting a food product from one end to a point adjacent the other. A vertical discharge flue is positioned adjacent the discharge end of the casing and is in communication with an opening at the bottom thereof. Heat-exchanging liquid is introduced into the casing through orifices in the bottom to heat or cool the product, as the case may be, and in an amount sufficient to fill the casing to a level above that of the screw conveyor. The liquid entrains the product at a point adjacent the discharge end of the casing causing it to flow through the bottom opening thereof and vertically up through the discharge flue from which it passes over a weir at the top thereof at a level substantially equal to the elevation of the liquid in the casing. The liquid assisted transport thereby achieves elevation of the product without risk of damage thereto.

3,722,402

BARBECUE GRIDDLE

Elizabeth Emmett Plumley, Richmond, Va., assignor to David A. Brown, Richmond, Va., a part interest

Filed Nov. 18, 1969, Ser. No. 877,765
Int. Cl. A23b *1/04*
U.S. Cl. 99—467 **9 Claims**



A barbecue griddle adapted to overlie a charcoal fire or the like and including a heat conductive plate with an upper cook-

ing surface. A plurality of smoking apertures are spaced generally evenly about the plate and extend therethrough from the upper cooking surface to the lower plate surface. A downwardly extending flange defines, together with the lower plate surface, a smoke collection chamber for collecting smoke flowing upwardly from the fire and for directing the collected smoke upwardly through the smoking apertures so as to overlie the cooking surface. The outer periphery of the cooking surface is provided with an upwardly extending retainer means that inhibits grease from flowing over the side of the cooking surface and also serves to prevent food from freely sliding off the cooking surface. A suitable handle may be provided for the griddle.

3,722,403

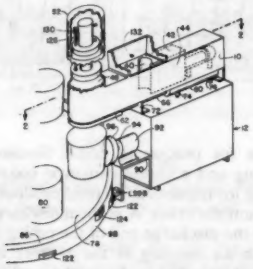
COMPACTING APPARATUS

Joseph F. Longo, New Canaan, Conn., assignor to International Dynetics Corporation, Norwalk, Conn.

Filed Oct. 29, 1969, Ser. No. 872,162

Int. Cl. B30b *15/16*

U.S. Cl. 100—49 **12 Claims**



A compactor comprising a compression chamber, ram means for compressing a slug of material, expulsion means for expelling the slug from the chamber and control means for maintaining continuous sequential operation.

3,722,404

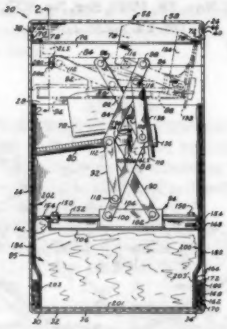
REFUSE COMPACTOR

Jerry W. Moon, 2735 Alveston, Bloomfield Hills, Mich.

Division of Ser. No. 148,879, June 1, 1971. This application Nov. 24, 1971, Ser. No. 201,839

Int. Cl. B30b *15/14*

U.S. Cl. 100—52 **16 Claims**



A refuse compactor including a receptacle removably contained within a cabinet wherein refuse is compacted by a ram to a fraction of its normal volume. The refuse is compacted within a specially constructed bag supported by the receptacle and cabinet, permitting the compacted refuse to be removed as a wrapped package for convenient and tidy disposal. The ram includes a refuse-compressing platen actuated through a toggle linkage to which force is applied by a single screw driven by an electric motor coupled to the screw through a reduction drive. The screw and its motor drive train are carried as a unit by the toggle linkage and move bodily therewith to provide a very compact and high ratio force multiplication system of reliable and inexpensive construction. Additional features relating to control circuitry, a safety lock, and bag, receptacle and drawer construction are also disclosed.

3,722,405

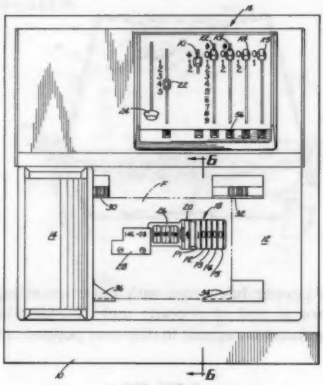
PRINT WHEEL SETTING AND CONTROL MEANS IN DATA RECORDERS

Donald T. Mahoney, Willoughby, and John A. Maul, Lyndhurst, both of Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Sept. 30, 1970, Ser. No. 76,938

Int. Cl. B41j *29/58*; B41f *3/04*

U.S. Cl. 101—45 **3 Claims**



A printing machine for imprinting forms with variable data from manually settable print wheels. The machine is provided with a bed for retaining the print wheels and the form, and includes a platen carriage to perform a printing cycle. The print wheels are selectively positioned by keyset levers movable from a reference datum position for rotating each print wheel to a desired peripheral setting. The machine is intended for printing numerical amounts; usually money values for check or money order imprinting. The number value to which each wheel may be set makes a theoretical setting greater than an arbitrary value maximum. In the example given herein, the print wheels have numbers which could be set up to print a value of 299.99 but for the advantages of this invention which limits the value to 200.00. Therefore, the levers, wheels, and associated structure cooperates to lock one another against further rotary positioning of the wheels to greater values whenever a given maximum is reached.

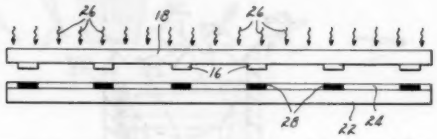
Secondly, if the keyset levers are not restored to their reference zero position after an imprint, a second operation is prevented.

3,722,406

VAPOR THERMOGRAPHIC DUPLICATING PROCESS

Doyle L. Strong, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 781,195, Dec. 4, 1968, abandoned. This application July 12, 1971, Ser. No. 161,850
Int. Cl. B41m 5/00; B41c 1/06; B41n 5/00
U.S. Cl. 101—469 6 Claims



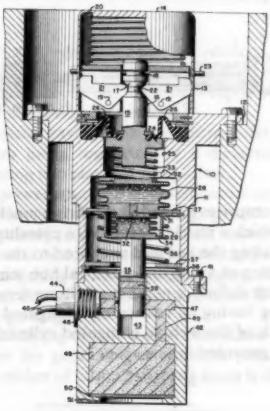
Heat activated duplicating process involving the steps of forming a coating on localized areas of a master sheet by transfer thereto from a transfer sheet, the coating being in the form of a discontinuous layer containing light colored normally stably solid, vaporizable first reactive material together with a particulate material and a minor amount of binder, placing the master sheet against a first receptor copy sheet which contains a second reactant material which coreacts with said first reactant to form a visible image, and subjecting the combined sheets to heat to vapor transfer a portion of the first reactant material, whereby an image is formed on the copy sheet, and repeating the heating step with additional receptor copy sheets to form additional copies.

3,722,407

DELAY ARMING DEVICE FOR SUBMARINE LAID MINES

Gordon L. Fogal, and Thomas W. Kennedy, both of Wayne, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 28, 1957, Ser. No. 668,834
Int. Cl. F42c 15/10
U.S. Cl. 102—16 7 Claims



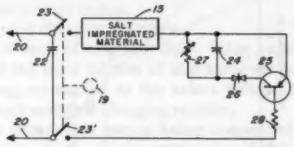
1. An arming device for a mine comprising a hydrostat, a first oil filled bellows movable by the hydrostat, a second oil filled bellows of less cross-sectional area than said first bellows, a means including baffle having a porous element interconnecting the interior of said first and second bellows to delay operation of the second bellows as the hydrostat operates, said second bellows movable at a faster rate and through a greater distance than said first bellows, a plunger actuatable by the second bellows from an initial position of rest to an armed position, and an explosive train arranged transversely within said plunger and movable from a safe position to an armed position as the plunger is moved to the armed position.

3,722,408

ANTI-SWIMMER CHARGE

John O. Fox, and Thomas H. Rosling, both of Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 20, 1970, Ser. No. 18,028
Int. Cl. F42c 3/00, 15/38
U.S. Cl. 102—16 3 Claims



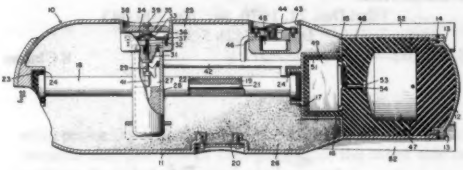
An anti-swimmer explosive charge device having a capacitor for energy storage and a water activated switch. The water activated switch consists of two terminals separated by a salt impregnated insulator. When the insulator becomes wet it conducts current from the energy source to a timing circuit.

3,722,409

MINE FIRING CONTROL APPARATUS

Ralph W. Mann, and Frank B. Johnson, both of Washington, D.C., assignors to the United States of America as represented by the Secretary of the Navy

Filed Aug. 28, 1943, Ser. No. 3,983
Int. Cl. F42b 22/30
U.S. Cl. 102—18 22 Claims



1. In a submarine mine for damaging a vessel, the combination of: a mine, electrical means responsive to a condition having a variable sign and caused by a vessel in motion for producing signals of opposite polarities in accordance with the sign of said condition, a pair of energy storage means, means controlled by said signals for selectively supplying said energy storage means with energy in accordance with the polarities of said signals, and means controlled by one of said energy storage means for firing the mine when the pair of energy storage means are successively supplied with energy within a predetermined period of time.

3,722,410

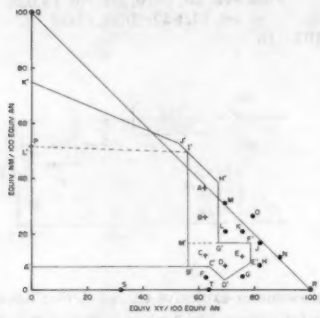
METHOD OF PETONATING AN AMMONIUM NITRATE-FUEL OIL COMPOSITION WITH A NUMBER 6 CAP

Gerald L. Hurst, Dallas, Tex., assignor to Kinetics International Corporation, Dallas, Tex.

Filed Oct. 8, 1970, Ser. No. 79,096
Int. Cl. F42d 1/00
U.S. Cl. 102—23 15 Claims

An economical and effective explosive composition is manufactured by combining appropriate proportions of ac-

tivated ammonium nitrate, a fuel and preferably a sensitizer. The preferred fuel is a liquid hydrocarbon derivative or a liquid or solid hydrocarbon derivative which is soluble in the sensitizer and which has a fuel value greater than that of the sensitizer. The preferred sensitizers are nitroalkane, or dinitroaromatic compounds most preferably nitromethane. The explosive composition is made more effective through an



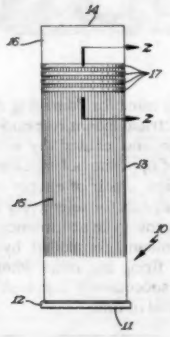
activation procedure upon the ammonium nitrate. The ammonium nitrate utilized with the present invention is in the form of prills, porous spherical pellets. These prills can be activated by adding a small amount of water to the prills, thoroughly mixing the water so that it is all absorbed, heating the prills to an elevated temperature, evaporating the water from the prills, and then preferably cooling the prills.

3,722,411

PLASTIC SHOTSHELL WITH SEALING RINGS

George L. Herter, Waseca, Minn., assignor to Herter's Inc., Waseca, Minn.

Filed Dec. 21, 1970, Ser. No. 100,043
Int. Cl. F42b *5/30*
U.S. Cl. 102—43 P 8 Claims



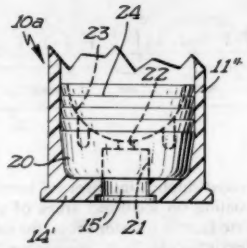
A plastic shotshell case to be loaded with powder and shot charges and wads separating the shot and powder; the plastic case having peripheral ribs or rings at the exterior adjacent the open mouth of the case and effectively sealing the case wall against the shotshell chamber in the barrel of the shotgun; the exterior peripheral surface of the case wall being smooth at a location forwardly of the sealing ribs.

3,722,412

ALL POLYETHYLENE SHOTSHELL CASE

George L. Herter, Waseca, Minn., assignor to Herter's, Inc., Waseca, Minn.

Filed Jan. 11, 1971, Ser. No. 105,410
Int. Cl. F42b *5/30*
U.S. Cl. 102—43 P 1 Claim



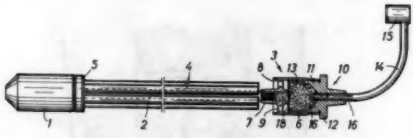
A shotshell case entirely of injection molded high molecular, high density polyethylene. The case having a base wall with a base wad thereon in overlying position, or having an integral base wad and base wall.

3,722,413

ARRANGEMENT IN ROCKETS

Bjarne Narvesen, and Edvard Troen, both of Raufoss, Norway

Filed Sept. 11, 1970, Ser. No. 71,611
Int. Cl. F42b *13/22*
U.S. Cl. 102—49.2 1 Claim



A rocket comprises a head and a firing mechanism including a rod to which a nozzle is secured, a plurality of propellant sticks surrounding the rod and anchored to the head, and the nozzle consisting of a ring and a central hub joined to the ring by a web which defines a number of circumferentially spaced bores, the ring having an rearwardly elongated portion forming at the back of the web an elongated cylindrical space and igniter means mounted in said space.

3,722,414

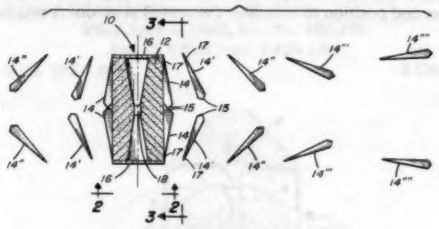
HIGH VELOCITY FLIGHT STABILIZED FRAGMENTATION DEVICE

James C. Talley, Dahlgren, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 13, 1966, Ser. No. 520,836
Int. Cl. F42b *13/48, 23/12, 25/00*
U.S. Cl. 102—67 3 Claims

There is disclosed an explosive controlled fragmentation device for obtaining high velocity attitude controlled projec-

tion of a plurality of darts. This is accomplished by controlling the thickness of the explosive adjacent the darts so as to obtain



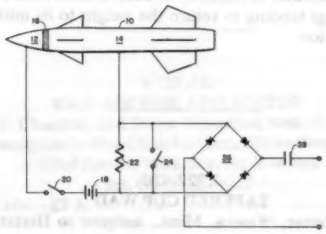
the impulse necessary to turn the darts into a blunt-end forward flight attitude.

3,722,415

ELECTROSTATIC CONTACT FUZE

Wilbur B. Lunt, Arlington, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed April 19, 1963, Ser. No. 274,901
Int. Cl. F42c *11/00, 19/06*
U.S. Cl. 102—70.2 R **1 Claim**



1. A contact fuzing system for use in ordnance which will operate at first contact with a target and does not depend upon deformation or deceleration of the weapon carrying the fuzing system for activation comprising:

a. a guided missile having first and second electrical conducting areas being separated by a dielectric material thereby forming two plates of a capacitor,

b. an electric power source connected across said first and second conducting areas for charging said areas to a potential inversely proportional to their respective areas,

c. a load resistor connected in series with said power source and said conducting areas for producing an output signal voltage when one of said conducting areas is discharged by contacting a target,

d. full-wave rectifying circuit means connected across said load resistor for producing a constant polarity output signal when either of said conducting areas is discharged.

3,722,416

FUZE FUNCTION SELECTION AND FIRING SYSTEM

Wilbur B. Lunt, Arlington, and Maurice H. Brown, Riverside, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 12, 1964, Ser. No. 352,429
Int. Cl. F44c *11/00;* **F42c** *13/00, 15/40*
U.S. Cl. 102—70.2 R **4 Claims**

1. In a selective multi-mode fuze firing circuit for a missile:

a. a select voltage input terminal means for accepting any one of three select voltages for selecting any one of proximity, impact-instantaneous and impact-delay modes of operation,

b. a fuze voltage supply input,

c. a proximity signal input,

d. an instantaneous detonation means,

e. a delay detonation means,

f. an impact fuzing means,

g. a two-position three-section switch means,

h. first and second fuse links,

i. a gas diode which will ignite in either direction at a specific potential,

j. a firing capacitor,

k. the first section being closed to ground and the second and third sections being open in the first position of said three-section switch means,

l. first and second charging resistors,

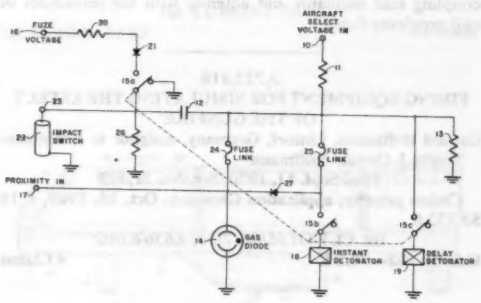
m. one side of each of said fuse links, firing capacitor and one side of the third section of said three-section switch means being connected to the select voltage input terminal through said first charging resistor,

n. said delay detonation means being connected between the other side of the third section of said three-section switch means and ground,

o. first and second diode rectifiers,

p. first and second bleeder resistors each connected to a respective opposite side of said firing capacitor,

q. the other side of said first fuse link being connected to



said proximity signal input, the cathode of said diode rectifier and one side of said gas diode; the other side of said gas diode being connected to ground,

r. the other side of said second fuse link being connected to the anode of said diode rectifier and one side of the second section of said three-section switch means,

s. said instant detonation means being connected between the other side of the second section of said three-section switch means and ground,

t. said impact fusing means being connected between the other side of said firing capacitor and ground,

u. one side of the first section of said three-section switch means being connected to the cathode of said second diode rectifier,

v. the other side of the first section of said three-section switch means being connected to the other side of said firing capacitor for connecting said capacitor to ground when the switch means is in a first position and to the cathode of said second diode rectifier when in its second position,

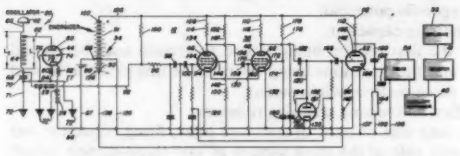
w. said second charging resistor being connected between the anode of said second rectifier and said fuze voltage supply input,

x. whereby each of any of said three select voltages applied to said select voltage input terminal will select a particular one of any of proximity, impact-delay and impact-instantaneous modes of operation.

3,722,417
BASE FUZE

Ralph O. Robinson, Jr., Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 28, 1956, Ser. No. 631,382
Int. Cl. F42c *13/04, 13/00*
U.S. Cl. 102—70.2 P **1 Claim**

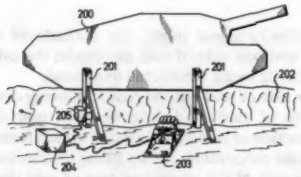


1. A hollow projectile having an explosive charge therein, said projectile having a rearwardly facing portion with an aperture formed therein, a closure plate for said aperture, a proximity fuze carried by said closure plate and including an oscillator and an antenna in the form of a conical structure projecting rearwardly from said closure plate, mounting means on said closure plate for supporting the remainder of said proximity fuze within said hollow projectile, and connecting means including a plurality of tapered pins engageable with and passing through said closure plate for electrically coupling said oscillator and antenna with the remainder of said proximity fuze.

3,722,418
FIRING EQUIPMENT FOR SIMULATING THE EFFECT OF THE GUNFIRE

Oswald Hoffmann, Lintorf, Germany, assignor to Hoffmann-Werke J. Oswald Hoffmann

Filed Sept. 11, 1970, Ser. No. 71,499
Claims priority, application Germany, Oct. 25, 1969, P 19 53 733.0
Int. Cl. F41f *15/00, 7/00;* **A63b** *63/02*
U.S. Cl. 102—70.2 R **4 Claims**



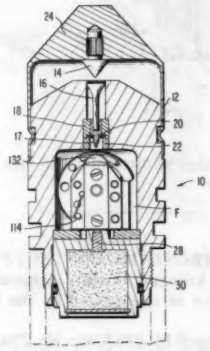
Firing equipment for simulating the effect of gunfire in which a plurality of firing cups having pyrotechnic devices in each cup and a separate detonating device to be selectively set off by means of control apparatus connected to a part in order to announce hits on the target.

3,722,419
ARMING DEVICE FOR MISSILES

John O. James, Lancaster, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Filed May 6, 1971, Ser. No. 140,849
Int. Cl. F42c *15/24*
U.S. Cl. 102—78 **1 Claim**

The arming device includes an unbalanced rotor adapted for movement in response to acceleration forces between a first missile unarmed position and a second missile armed position. A setback weight locks the rotor in the first position and is responsive to acceleration forces to release the rotor for movement into the second position. A detent movable in a direction normal to the plane of the rotor engages the rotor in the second position to lock it in the armed position. A second

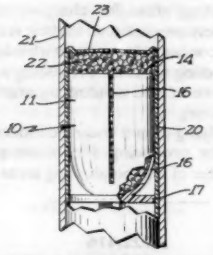


detent carried by the setback weight is movable in a direction parallel to the plane containing the rotor to engage the rotor in the second position in response to deceleration forces and the bias of springs tending to return the weight to its initial rotor locking position.

3,722,420
TAPERED CUP WAD

George L. Herter, Waseca, Minn., assignor to Herter's, Inc., Waseca, Minn.

Filed Nov. 4, 1970, Ser. No. 86,711
Int. Cl. F42b *7/06*
U.S. Cl. 102—95 **2 Claims**



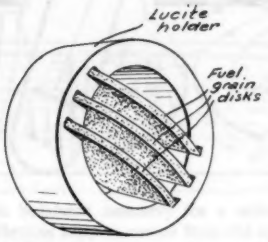
A combination shot cup and wad for a shotshell with a sealing base and a connecting structure attached to the bottom of the tapered shot cup which has a slitted sidewall tapering convergently away from the open end and toward a base disc which extends outwardly to the sidewall of the shotshell case.

3,722,421

SOLID BIPROPELLANT

Arthur E. Thrailkill, Bel Air, and Robert W. Geene, Aberdeen, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed April 4, 1962, Ser. No. 185,185
Int. Cl. C06d *5/06*; F42b *1/00*
U.S. Cl. 102—101 2 Claims



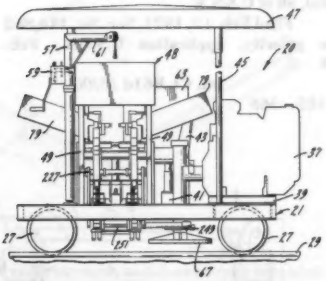
A solid bipropellant grain having a specific impulse of over 275 seconds comprising a slotted, single perforate, internal burning oxidizer grain and adjacent pressed lithium aluminum hydride plates in which the greatest surface is exposed to the flow of the combustion products of the oxidant.

3,722,422

RAIL ANCHOR APPLICATOR

Arthur J. Chandre, and Dieter Moericke, both of Milwaukee, Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Nov. 6, 1969, Ser. No. 874,498
Int. Cl. E01b *29/32*
U.S. Cl. 104—17 A 13 Claims



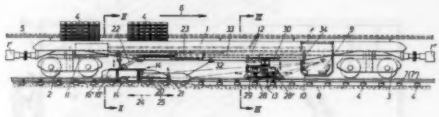
A method of and rail anchor applicator for practicing the method of applying either one or two rail anchors to a rail with the anchors abutting the sides of a tie. The applicator includes magazines for holding rail anchors and positive feed means for delivering the anchors from the magazines and holding them for removal by the anchor applying means. Anchor applying shoes are adapted to remove the anchors from the feed means and apply them to a rail against opposite sides of a tie in a continuous operation. The anchors are applied and fully seated on the rail base in one operation with a minimum of ballast disturbance and a minimum of preliminary ballast excavation.

3,722,423

MOBILE BALLAST TREATING AND RAIL FASTENING ELEMENT ENGAGING TOOL UNIT

Franz Plasser, and Josef Theurer, both of Johannesgrasse 3, Vienna 1, Austria

Filed Dec. 10, 1970, Ser. No. 96,706
Claims priority, application Austria, Dec. 17, 1969, 11757
Int. Cl. E01b *27/00, 29/28*
U.S. Cl. 104—17 R 11 Claims



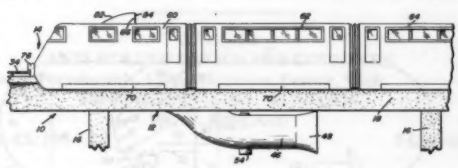
A mobile track working unit comprises a ballast plow and a tool for connecting or disconnecting ferrous rail fastening elements attaching the rails to the ties.

3,722,424

AIR TRACK AND VEHICLE THEREFOR

John Van Veldhuizen, 31601 S.W. 197th Avenue, Homestead, Fla.

Filed Dec. 17, 1970, Ser. No. 99,137
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 FS 8 Claims



An elongated tubular structure to comprise at least a portion of a trackway along which a vehicle may move in a guided manner. A longitudinal slot is formed throughout one longitudinal wall portion of the structure and seal means is provided for releasably sealing the slot throughout at least substantially its entire length. The seal means is constructed in a manner whereby at least portions thereof may be deflected for opening the slot throughout the length of a predetermined longitudinal extent thereof and air pump means is operatively associated with the tubular structure for supplying the interior thereof with air under pressure. A vehicle is provided for guided movement along the tubular structure and the vehicle includes portions thereof which at least partially embrace the slotted portion of the tubular structure. Also, the vehicle is provided with structure operative to open the seal means of the tubular structure in the area thereof embraced by the vehicle as the latter moves along the tubular structure and the vehicle includes means by which air escaping from the tubular structure throughout the portion thereof having its seal means displaced to an open position may be utilized to propel the vehicle along the tubular structure and/or support the vehicle from the tubular structure by the formation of an air cushion between the vehicle undersurface portions and opposing upper surface portions of the tubular structure.

3,722,425
METHODS OF SORTING OR SELECTING ARTICLES ON A CONVEYOR PATH AND APPARATUS USED THEREFOR

Colin James Allen, 1 Turner St., Dunedin, New Zealand

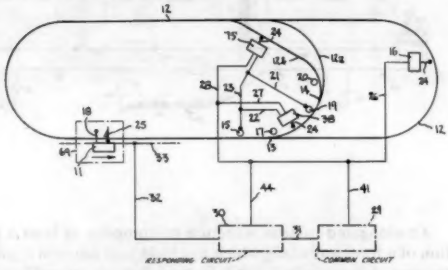
Filed Sept. 8, 1970, Ser. No. 70,457
Claims priority, application New Zealand, Sept. 8, 1969, 157715
Int. Cl. B65g *43/08*
U.S. Cl. 104—88 5 Claims

The sorting and selecting of articles on a conveyor path in which a code carrying means is associated with an article moving along the conveyor path, a selected code on the code carrying means is set, with the code carrying means and articles associated therewith being moved along the conveyor path until the pre-set code on the code carrying means activates automatically a discharge means to discharge the article associated with the code carrying means from the conveyor path at the preselected position.

3,722,426
AUTOMATED TRACK-GUIDED MATERIAL HANDLING SYSTEM WITH ELECTRICAL PULSE PROGRAMMING

Egon Beer, 1163 East 332nd Street, Eastlake, Ohio

Filed April 15, 1971, Ser. No. 134,136
Int. Cl. B61l *27/04*
U.S. Cl. 104—88 11 Claims



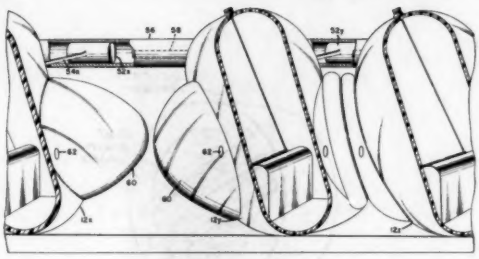
An automated material handling system utilizing a track-guided electrically powered material transporter and a plurality of work stations located in spaced relationship along the track. A common control circuit interconnects all the stations and is activated by an electrical pulse circuit operable from any station for selectively directing movement of the transporter to or from one of the stations along any portion of the track. The system includes safeguard control means for correcting or preventing ineffectual or overlapping programming of the transporter movement.

3,722,427
PNEUMATIC TRANSIT SYSTEMS

Wyly Kenneth Crowder, 3255 Windcroft Drive, Pontiac, Mich.

Filed May 24, 1971, Ser. No. 146,352
Int. Cl. B61b *13/00*
U.S. Cl. 104—155 10 Claims

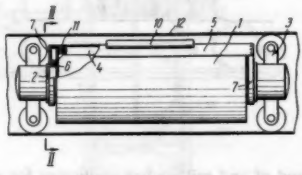
A pneumatic transit system for vehicles and material handling means in which the propulsion means is a linear air motor which operates by means of progressive air impulses. The air motor is controlled to provide space monitored acceleration and decelleration for passengers or materials. A structural tube along the travel path provides the two way guide and air duct with pressurized air expanded down through the linear air motor to silent ambient pressure. Each vehicle has a piston in an air tube to act as a cushion or shock absorber to prevent collision with adjacent vehicles.



3,722,428
CONTAINER FOR PNEUMATIC CONVEYANCE OF LOADS ALONG A PIPE CONDUIT

Adolf Moritsovich Alexandrov, Federativny Prospekt, 6, Korpus 3, kv. 8, Moscow; Ippolit Davidovich Suladze, prospekt Chavchavadze, II, kv. 41, Tbilisi; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61, Moscow; Avtandil Semenovich Kakhniashvili, ulitsa Eliava, 37, kv. 41, Tbilisi; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45, Moscow; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261, Moscow; Matvei Iosifovich Rozenfeld, Borisovskaya ulitsa, 21, kv. 49, Moscow, and Grigory Yasonovich Chidzhavadze, prospekt Chavchavadze, II, kv. 5, Tbilisi, all of U.S.S.R.

Filed Feb. 12, 1971, Ser. No. 114,862
Claims priority, application U.S.S.R., Feb. 17, 1970, 1401628
Int. Cl. B61d *15/00*
U.S. Cl. 105—365 3 Claims



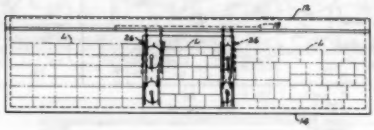
A container for pneumatic conveyance of loads along a pipe conduit, in which a housing mounted on running carriages by means of trunnions is provided with a port located on top in its cylindrical wall which may be closed with a lid. The lid is a portion of the cylindrical wall of the housing, connected with the arms of levers mounted on the trunnions and serving to turn the lid by circumferentially sliding the lid along the housing periphery.

3,722,429

INFLATABLE BULKHEAD ASSEMBLY FOR RAILWAY FREIGHT CARS

Jan D. Holt, Saint Charles, and Garth R. Smith, Saint Peters, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,165
Int. Cl. B60p 7/14; B61d 45/00
U.S. Cl. 105—369 BA 9 Claims



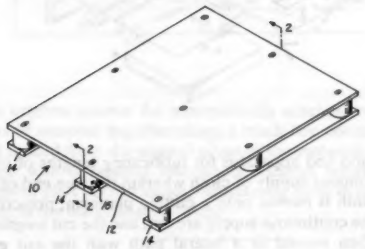
A pneumatic bulkhead assembly for a railway box car suspended by flexible support means from the upper portion of the box car. The bulkhead assembly includes upper and lower bulkhead sections each of a height generally around one-half the height of the car and mounted on the flexible support means in a vertically spaced relation to each other with the lower bulkhead section mounted for a limited resilient movement relative to the upper bulkhead section. Each bulkhead section includes a pair of generally flat faces and a pneumatic bag between the faces to urge the faces outwardly upon inflation.

3,722,430

PALLETS

Clifford E. Woodley, Grants Pass, and Herbert S. Carter, Rouge River, both of Oreg., assignors to said Woodley, by said Carter

Filed Dec. 1, 1971, Ser. No. 203,525
Int. Cl. B65d 19/38
U.S. Cl. 108—58 2 Claims



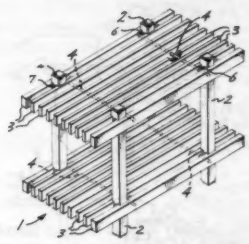
A pallet of great strength and durability is provided at small cost, which comprises an upper continuous, rigid sheet of plywood, chipboard, plastic or other suitable material, and a lower sheet or set of strips of like material. Identical cylindrical chipboard spacers of substantial diameters and uniform thickness, which are not subject to cracking or splitting, are interposed at regular intervals between the upper and lower sheets. The spacers oppose parallel wooden surfaces to the inner faces of the sheets. Metallic eyelets fit centrally through the respective spacers and through sheet portions in contact with each spacer, the eyelets being outturned at their ends and having the outturned end portions pressed into flush relation with the outer faces of the sheets. The prongs of a forklift can be inserted from either end or from either side of the pallet so that the center of mass of the pallet and any load carried by it may be disposed between the prongs of the forklift.

3,722,431

SLAT PANEL FURNITURE

Paul N. Howard, Seattle, Wash., assignor to Howard Manufacturing Company, Kent, Mass.

Filed Dec. 24, 1970, Ser. No. 101,340
Int. Cl. A47b 3/06
U.S. Cl. 108—153 15 Claims



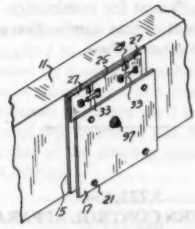
Disclosed are articles of furniture of varying configurations producible in knock-down form consisting of wood dowel and slat grid panels supported by notched wood legs. The panels consist of wood slats joined together and maintained in parallel coplanar relationship by wood dowels passing intersectingly therethrough intermediate the panel ends. The notched segments of the legs are dimensioned to interfit slidably with and between adjacent slats for assembly of legs with a grid panel. The adjacent slats interengaging the leg notches orient the legs to the panel, and by abutting the legs to dowels the latter serve most effectively to maintain the slat spacing constant where the legs react against the slats; also as locating elements for the legs in assembly and as anchor elements for leg fasteners applied to complete an aesthetically and structurally integrated assembly.

3,722,432

ANTI-HOLDUP DEVICE FOR COUNTERS

Themis Pervolarakis, 17710 McIntyre, Detroit, Mich.

Filed Dec. 9, 1971, Ser. No. 206,336
Int. Cl. E05g 3/00
U.S. Cl. 109—17 7 Claims



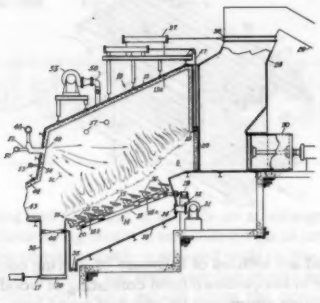
An anti-holdup device for a counter which comprises a backing plate mountable upon the rear wall thereof supporting a pair of upright guide tubes in which normally retracted elevator rods are nested. A shield is secured to the rods and normally positioned below the top of the counter. A detent releasable weight is guideably mounted in elevated position for movement between said tubes; and cables at their one ends are secured to said weight, extend around a pair of pulleys, and at their other ends respectively are connected to said elevator rods. The shield includes a pair of hinged wings normally held in alignment with the shield body by a panel, and spring biased to pivot at right angles thereto when elevated past the panel.

3,722,433

METHOD AND APPARATUS FOR WASTE INCINERATION

Ralph J. Kramer, 6180 Olentangy River Rd., Delaware, Ohio

Filed May 18, 1971, Ser. No. 144,432
Int. Cl. F23g *3/00*
U.S. Cl. 110—8 R **23 Claims**



Waste incineration apparatus and method are provided having two serially connected combustion chambers for incineration of solid, semi-solid and liquid waste material, each of which comprises combustible components. The combustion chambers are relatively positioned so that heated gaseous fluids produced by combustion of substantially only solid and semi-solid waste introduced into the first chamber are discharged into the second chamber for enhancement of combustion of liquid waste introduced into the second chamber. These gaseous fluids which are at a relatively high temperature include those that enable or support combustion of liquid waste and may also include those that are combustible when combined with additional combustion air with these gaseous fluids intermixing with liquid waste entering the second chamber thereby enhancing the combustion characteristics of the liquid waste. Preferably, combustion in the first chamber is carried out in the presence of a substantial amount of excess air resulting in complete combustion and preheating of the remaining combustion air prior to its entry into the second combustion chamber. Alternatively, combustion in the first chamber is controlled by limiting the amount of combustion air admitted to that necessary to effect burning of the solids or semi-solids but not sufficient for combustion of the gaseous fluids evolved as a result of that combustion process thereby forming a combustible gaseous fluid.

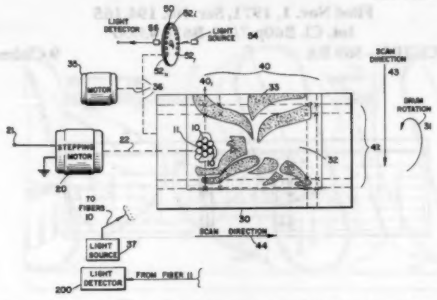
3,722,434

DIGITAL PATTERN CONTROL APPARATUS FOR TEXTILE MACHINERY

Fred P. Strother, West Point, and James O. Blackstone, Jr., LaGrange, both of Ga., assignors to West Point Pepperell, Inc., West Point, Ga.

Filed Feb. 23, 1971, Ser. No. 118,030
Int. Cl. D05c *15/26*
U.S. Cl. 112—79 A **14 Claims**

Apparatus for developing a pattern in textile goods formed by a tufting operation employs an array of optical fibers to optically scan a replica of the desired pattern. The continuous output scan signal is digitally quantized, and sampled by scan-synchronized strobe circuitry to provide a series of binary information bits descriptive of the scanned pattern with accurate resolution. The serial bits are converted to parallel form, and preserved in a storage medium together with control information as plural bit frames of predetermined format. Pattern implementing control circuitry operates asynchronously under control of the tufting machine to automatically receive present stitch (row) and next stitch information in corresponding holding registers from the pattern



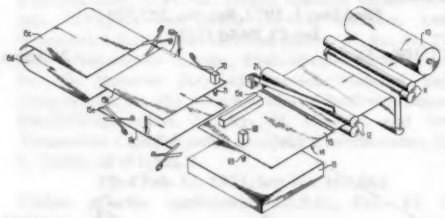
storage medium. Pattern controllers are responsive to the binary digital information stored in the present stitch register for determining the pattern-defining operations effected by tufting stations disposed across the width of the tufting machine.

3,722,435

CLOTH CUTTING AND HEMMING METHOD AND APPARATUS

Norman E. Elsas, Atlanta, Ga., assignor to Nemo Industries, Inc., Atlanta, Ga.

Filed Jan. 27, 1971, Ser. No. 110,132
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **7 Claims**



The method and apparatus for fabricating lengths of cloth from a continuous supply of cloth wherein the free end of the supply of cloth is moved onto a cutting platform, prescribed lengths of the continuous supply are cut, and the cut lengths of cloth are then moved in a lateral path with the cut ends disposed generally parallel to the path of travel. One cut end of each of the cut lengths of cloth is hemmed, and the lengths of cloth are then inverted as they are moved through a U-shaped path, and the other end of each length of cloth is hemmed. The hemming function at both ends of the cut lengths of cloth are performed by right handed sewing machines.

3,722,436

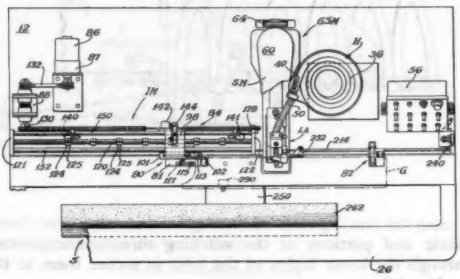
GARMENT WORKING MACHINE

James L. Strouse, Muscatine, Iowa, assignor to McKee Button Company, Muscatine, Iowa

Filed Feb. 23, 1971, Ser. No. 118,119
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **8 Claims**

A machine for performing a work operation on a garment, for example, a button sewing operation, including a frame, a button sewing machine on the frame and improved means for

indexing the garment past the button sewing machine in a precise predetermined relationship. The indexing machine includes first adjustable clamping means and second adjustable clamping means and carriage means for moving the clamping



means predetermined increments from a first position to a second position to permit buttons to be sewn on the garment at spaced intervals between said two positions corresponding to said predetermined increments.

3,722,437

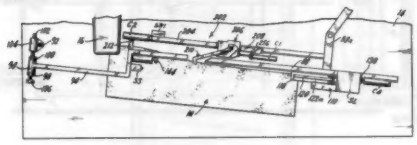
INTERMEDIATE CLAMP FOR CONTOUR SEAMER

Paul N. Winberg, 40 Villa Court, Hempstead, N.Y., and Robert W. Winberg, 19 York Place, Williston Park, N.Y.

Filed Nov. 24, 1971, Ser. No. 201,767

Int. Cl. D05b *21/00*

U.S. Cl. 112—121.12 **7 Claims**



A contour seamer for automatically stitching two or more plies of material together along a stitch line coextensive with and spaced from the aligned edges of the material plies is provided with a floating intermediate clamp which grips the material plies at their edges, maintaining them in proper alignment as the material is advanced.

3,722,438

SEWING MACHINE WITH MULTI-NEEDLE SUPPORTING ARM

Fidelius Schinzel, Karlsruhe, and Helmut Schwannecke, Ettlingen, Germany, assignors to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Karlsruhe, Germany

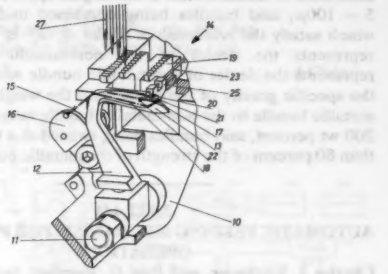
Filed Jan. 15, 1971, Ser. No. 106,677

Claims priority, application Germany, Jan. 21, 1970, G 70 01 852.9

Int. Cl. D05b *1/06*

U.S. Cl. 112—199 **2 Claims**

A sewing machine with a multineedle supporting arm is provided with an oscillating thread gripper moving transversely to the direction of the sewing operation for forming below the throat plate a thread loop into which enter the sewing needles with their upper thread. A horizontal thread spreader fixedly attached to and moving with the material feeder extends with one end provided with a holding tongue into the thread loop to hold the latter temporarily during the rearward movement of the thread gripper, so as to provide an additional length of



lower thread on one side of the row of needles which supply the upper thread, said additional length of lower thread is necessary for producing a seam.

3,722,439

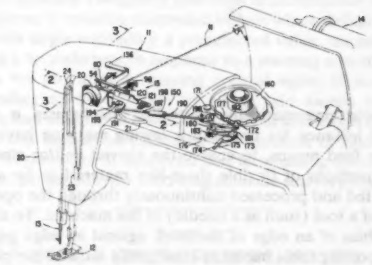
PROGRAMMED COLOR STITCHING MECHANISMS FOR SEWING MACHINES

Albert L. Newman, Cleveland Heights, Ohio, assignor to The Singer Company, New York, N.Y.

Filed April 6, 1971, Ser. No. 131,622

Int. Cl. D05b *47/00*

U.S. Cl. 112—254 **8 Claims**



A pattern cam influenced mechanism for changing the tension which is applied to one or more of the sewing threads being concatenated by a sewing machine between successive stitches or between successive stitch groups. Where a plurality of threads of different color are used in the stitch formation, the arrangement of this invention can result in a pattern cam control of the color of the stitches appearing on the exposed face of the work fabric.

3,722,440

ELECTRICALLY CONDUCTIVE THREADS AND METHOD OF MANUFACTURING CLOTHING EXHIBITING ANTI-STATIC PROPERTIES THEREWITH

Yoshikazu Igarashi; Yoshio Bessho; Yoshikazu Kiroku, and Yasuo Takahashi, all of Okayama, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

Filed March 30, 1971, Ser. No. 129,630

Claims priority, application Japan, April 1, 1970, 45/28720; May 13, 1970, 45/40784

Int. Cl. D05b *1/00*

U.S. Cl. 112—262 **10 Claims**

A method of manufacturing clothing exhibiting anti-static properties is provided comprising preparing said clothing by sewing, weaving or knitting with at least one electrically conductive thread comprising a non-metallic bundle of natural,

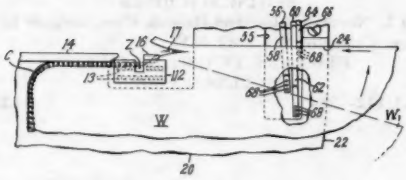
semi-synthetic or synthetic filaments, fibers, split fibers or tapes having a shrinkage ratio of less than 15 percent in water at 100°C. and a metallic bundle of iron, nickel, copper, brass, aluminum or stainless steel exhibiting an apparent diameter of 5 – 100μ, said bundles being combined under conditions which satisfy the relationship: $S^2\,dm \geq df \geq 5$ wherein df represents the denier of the non-metallic bundle, dm represents the denier of the metallic bundle and S represents the specific gravity of the metal, and the weight ratio of the metallic bundle to the non-metallic bundle ranges from 0.1 to 200 wt percent, said bundles being twisted at a tension of less than 80 percent of the strength of the metallic bundle.

3,722,441

AUTOMATIC FEEDING MECHANISM FOR PERIPHERAL OPERATIONS

Charles J. Kitchener, and Paul G. Rumball, both of Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Jan. 18, 1971, Ser. No. 107,022
Int. Cl. D05b *27/14*
U.S. Cl. 112—205 **12 Claims**



An electro-pneumatically controlled mechanism is provided, for instance for use with a sewing machine having a rectilinear feed means, to enable the curved and/or straight marginal portions of flexible sheet-like material to be automatically fed and processed continuously through the operating zone of a tool (such as a needle) of the machine. To aid in attaining bias of an edge of the work against an edge gage a work supporting table has an at least partly arcuate periphery over which the work may be draped. A corner sensing means actuates a mechanism for gripping a portion of the work at the proper time and swinging it approximately about a turning center thereby progressively positioning the work relative to the tool. In an illustrative over-edging machine, which is provided with conventional trimming means, a rectangular work piece thus progressively has its successive corners trimmed to a predetermined radius and sewn. A second sensor counts the successive corners turned in order to automatically stop operations when all or a desired portion of a periphery has been processed. A third sensor automatically serves to check pressure of the engagement of a work edge with the edge gage to prevent unwanted buckling or folding of the work edge.

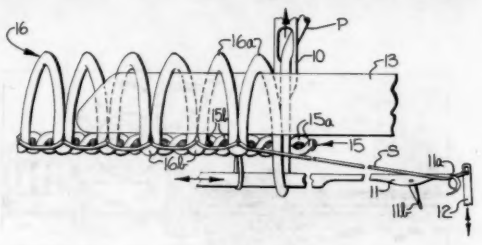
3,722,442

TUFTED PILE FABRICS AND METHOD OF MAKING SAME

John T. MacIsaac, Jr., and James E. Troy, both of Eden, N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Filed Jan. 29, 1971, Ser. No. 110,967
Int. Cl. D05c *17/02*
U.S. Cl. 112—410 **29 Claims**

A tufted pile fabric and method of making the same in which rows of pile tufts are formed extending upwardly from the upper face of a backing fabric or base and have lower bights at least partially positioned above the plane of the lower face of the backing fabric to permit use of less pile yarn for obtaining any given height of pile. Also, a plurality of stitching threads are positioned along the lower face of the backing



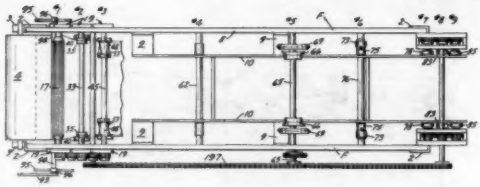
fabric and portions of the stitching threads are inserted through the lower bights of the tufts to secure them to the backing fabric.

3,722,443

METHOD OF FORMING A RECTANGULAR HEAT DUCT

Leroy E. Anderson, and Gerald J. Munn, both of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Division of Ser. No. 12,663, Feb. 19, 1970, Pat. No. 3,636,903.
This application Dec. 8, 1971, Ser. No. 205,843
Int. Cl. B21d *39/02*
U.S. Cl. 113—54 **22 Claims**



A machine designed to continuously progress a pair of elongated flat sheets of metal longitudinally through a plurality of cooperative dies which progressively in sequential steps gradually shape the two sheets into a duct having a rectangular cross-sectional configuration. The machine utilizes cooperative rotary dies to shape and form the duct in a continuous operation to a length equal to that of the sheets so that rectangular ducts of any desired length can be produced in an automatic operation by merely inserting into the machine a preprepared roll comprised of a pair of sheets of metal of the desired length, the sheets entering the machine at one end and leaving the same at the other end in the form of a continuous rectangular duct.

3,722,444

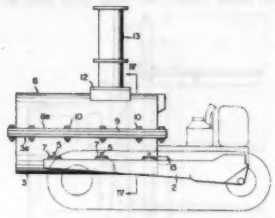
STRUCTURE OF UNDER-WATER VEHICLE

Kiichi Muraki, Hirakata, and Tadashi Yoda, Neyagawa, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed April 20, 1971, Ser. No. 135,702
Claims priority, application Japan, April 20, 1970, 45/33029
Int. Cl. B63c *7/00*
U.S. Cl. 114—16 R **3 Claims**

The present invention relates to an under-water vehicle structure comprising connecting, through sealing material,

open end fringe of the upper box whose lower side is opened to the open end fringe of the lower box whose upper side is



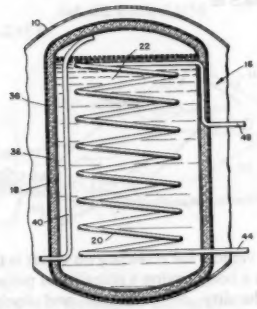
opened, said lower box being fixed on the right and left main beams supported on the track-frames.

3,722,445

UNDERWATER MOLTEN SALT HEAT STORAGE BOILER

Horace Edmund Karig, Pasadena, Calif., and Gerrit De Vries, Altadena, both of Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 21, 1965, Ser. No. 500,389
Int. Cl. B63g *19/00, 21/06, 21/08*
U.S. Cl. 114—16 G **4 Claims**



1. An underwater vehicle including apparatus for generating steam for propelling same, comprising;

a. a closed thin wall container having a void space at its upper end,

b. a meltable salt mixture filling said container below said space, said mixture having substantially zero coefficient of expansion at its solidifying temperature, the solidifying temperature being in excess of 212° F,

c. the outside of said container being in contact with and subjected to water at ambient pressure,

d. means for pressurizing said space to ambient water pressure whereby the salt mixture, when melted, subjects the inside of said container to ambient water pressure,

e. a steam generating coil disposed within said salt mixture having a water inlet at its lower end and a steam outlet at its upper end adapted to extract heat from the salt mixture and cause it to solidify, first at the bottom of the container, and thereafter in succeeding layers thereabove, and

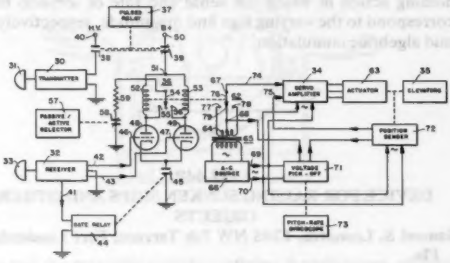
f. a source of superheated steam for melting said salt mixture disposed at the surface of the water and means for connecting said coil to same.

3,722,446

TORPEDO HOMING SYSTEM

David A. Cooke, Kansas City, Mo., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 6, 1956, Ser. No. 596,366
Int. Cl. F42b *19/01*; **G01v** *1/00*
U.S. Cl. 114—23 **4 Claims**



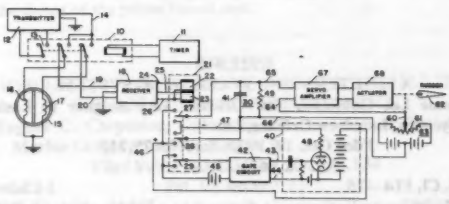
1. An active-acoustic-homing torpedo, comprising means for cyclically generating and projecting an acoustic search pulse having short duration relative to the cyclic period, means for receiving and converting a resultant target echo to steering command signals having characteristics which define sense and magnitude of target direction angle as referenced to said torpedo, a steering circuit including a relay having a pair of actuation coils and three-position switch means adapted to be thrown from a normal position to a position dependent upon the sense of differential energization of said coils, means for differentially energizing said coils in accordance with and in response to steering command signals which define a target direction angle exceeding a preselected value, means for effecting a torpedo turn in response to a steering control signal, means for providing a steering control signal of sense corresponding to the position to which said switch means is thrown and adapted to effect reduction of said target direction angle, and means for extending the duration of said control signal beyond that of said echo and terminating upon generation and projection of a following acoustic search pulse.

3,722,447

HOMING MISSILE STEERING SYSTEM

William Altar, and Carl W. Helstrom, Jr., both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed April 30, 1957, Ser. No. 656,168
Int. Cl. F42b *19/01*; **G01v** *1/00*
U.S. Cl. 114—23 **6 Claims**



1. In an acoustic homing torpedo of pulse-echo type having means for converting received target echoes to output signals defining the sense of target direction referenced to torpedo heading, in combination, means controlled by said output signals for providing target direction samplings in the form of charge increments which are substantially uniform but of sign corresponding to the sense of target direction, means for

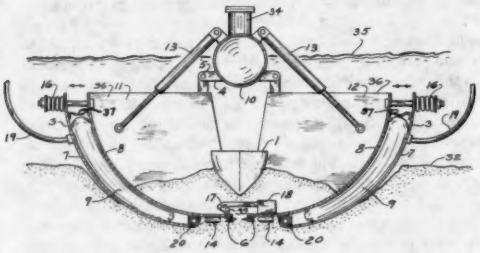
decaying each of said samplings in accordance with a predetermined time-function to provide weighting which favors the most recent sampling, means for providing a continuous algebraic cumulation of the decaying samplings, means for providing a steering command signal having characteristics varying in accordance with the varying sign and magnitude of the said algebraic cumulation, and torpedo steering means controlled by the steering command signal and in accordance with said characteristics thereof to provide target homing action in which the sense and rate of torpedo turns correspond to the varying sign and magnitude, respectively, of said algebraic cumulation.

3,722,448

DEVICE FOR RAISING SUNKEN SHIPS AND OTHER OBJECTS

Samuel S. Leonardi, 1245 NW 7th Terrace, Fort Lauderdale, Fla.

Filed Aug. 10, 1970, Ser. No. 62,344
Int. Cl. B63c *7/24*
U.S. Cl. 114—55 **6 Claims**



A device for raising sunken ships and other objects, in which elongated arcuate buckets, pivoted to a floating supporting member, are placed in position on opposite sides of the sunken ship. A chain saw on the open end of the buckets, assisted by water jets, cuts a path through the silt surrounding the ship, until the buckets meet below the ship, where the buckets are latched together. A plurality of bags, carried by the buckets, are then inflated, providing sufficient buoyancy to raise the ship.

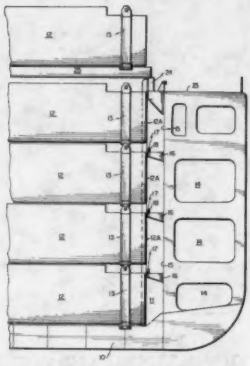
3,722,449

A LIGHTER - SHIP STABILIZING SYSTEM

Jerome Lee Goldman, New Orleans, La., assignor to Lash Systems, Inc., New Orleans, La.

Filed Oct. 12, 1970, Ser. No. 79,718
Int. Cl. B63b *25/08, 35/44*
U.S. Cl. 114—75 **1 Claim**

The present disclosure is directed to a lighter-ship stabilizing system for securing vertical stacks of lighters within cargo holds against tilting or rocking of the stack of lighters relative to the ship to effectively make the stack of lighters and the ship a single instrumentality which resists relative motion between lighters and ship incident to dynamical sea conditions such as pitch, roll and yaw. This rigid interplay between lighter and ship is based upon the fact that the lighters may be nested or stacked within the hold so that as between lighters in a particular stack there is interlocking rigidity and the stack is made rigid with the ships hull by wedging the stacks of lighters against the hull. This interlocking is attained by the use of



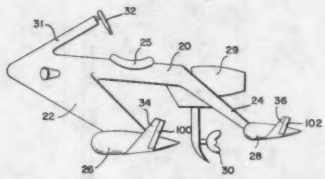
wedge blocks secured to the hull and tapered wedges which are dropped between the stack of lighters at each lighter and rigid part of the ships hull.

3,722,450

HIGH SPEED VEHICLE FOR TRAVELING ON WATER

Kunitaka Arimura, One Washington Circle, Washington, D.C.

Filed May 15, 1970, Ser. No. 37,573
Int. Cl. B63b *1/26*
U.S. Cl. 114—66.5 H **16 Claims**



A high speed vehicle for traveling on water is provided. The vehicle includes a body having a plurality of projecting legs for mounting a plurality of pontoons and hydrofoils. In a preferred embodiment the pontoons are slidably mounted on the legs for movement relative to the hydrofoils so that during movement of the vehicle at high speed the pontoons can be raised completely out of the water. The preferred embodiment also includes a plurality of elevators pivotally mounted on the hydrofoils for varying the angle of attack of the hydrofoils relative to the water surface. In addition, the legs of the vehicle are adjustable so that the body of the vehicle can be moved downward toward the water surface during high speed movement of the vehicle to lower its center of gravity and enhance its stability.

3,722,451

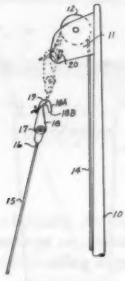
AUXILIARY HOOK STAY

William L. Banks, Jr., 226 Warner Avenue, Roslyn Heights, N.Y.

Filed Sept. 21, 1971, Ser. No. 182,425
Int. Cl. B63h *9/04*
U.S. Cl. 114—102 **2 Claims**

Auxiliary stays for a sail boat and means of mounting same on the mast, in which a stay bracket is provided at the top of the mast. Said stay bracket supporting a pulley over which a halyard is extended from the deck over the pulley and back to the deck. A stay pin being mounted in said bracket but posi-

tioned below the halyard pulley. Said auxiliary stay having a hook affixed to one end of the stay line. The auxiliary stay mounted by affixing the upper end of the hook to the extended end of the halyard and by pulling the opposite end of the halyard, the hook and stay may be raised until the hook abuts

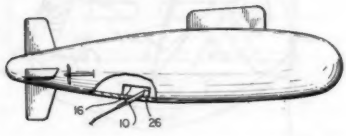


with the mast bracket, the hook riding over the stay pin and by a slight release of the stay line, the hook engages the stay pin and the auxiliary stay is engaged and may be used to put tension or pulling force on the mast. The direction of pull being chosen initially as fore, aft, port or starboard.

3,722,452
SUBMARINE TOWING SYSTEM

John F. Wynn, Jr., Landover, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed May 20, 1971, Ser. No. 145,378
Int. Cl. B63b *21/56*
U.S. Cl. 114—235 B **6 Claims**



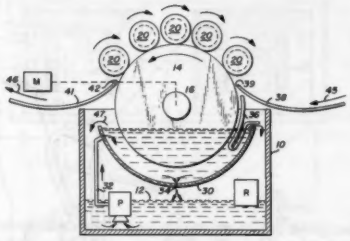
The invention is a system for subsurface tow, deployment and recovery of a submersible vehicle or small submarine by another submarine utilizing a telescopic boom (powered or unpowered), a winch, an oceanographic tow line and a coupling device. The system is designed to be stowed in an existing well of a modern submarine.

3,722,453
LIQUID TONING APPARATUS

John A. Dahlquist, and Ivor Brodie, both of Palo Alto, Calif., assignors to Photophysics, Inc., Mountain View, Calif.

Filed April 5, 1971, Ser. No. 130,904
Int. Cl. B05c *1/02*
U.S. Cl. 118—246 **13 Claims**

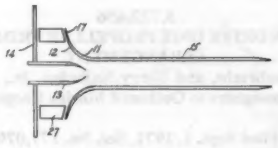
Liquid toning apparatus is disclosed for developing a latent electrostatic image on the surface of a dielectrically coated sheet of flexible paper. The apparatus comprises a reservoir adapted to contain liquid toner at a predetermined liquid toner surface level. A rotatable cylinder is mounted for rotation about a cylinder axis disposed above and substantially parallel the liquid toner surface level a distance less than the radius of the cylinder whereby a portion of the rotatable cylinder is positioned above the liquid toner surface level, and another portion of the rotatable cylinder is simultaneously positioned beneath the liquid toner surface level. A plurality of juxtapositioned rollers are mounted adjacent the rotatable cylinder for rotation about a plurality of roller axes disposed above and substantially parallel the cylinder axis with the rollers and the rotatable cylinder defining therebetween an arcuate toning station. Guide means are also provided for guiding sheets of flexible paper into the arcuate toning station.



3,722,454
THRUST AUGMENTER

Richard Silvester, 132 Essex St., Wembly, Australia

Filed Oct. 28, 1970, Ser. No. 84,754
Int. Cl. B63h *5/14*
U.S. Cl. 115—34 R **5 Claims**



A device for augmenting the thrust from the prime thrust unit of a vessel wherein the thrust unit is surrounded by a shroud having a flared entrance placed in close proximity to the hull of the vessel so that the velocity of fluid being drawn into the shroud increases thus reducing the pressure of fluid acting on the leading face of the flared entrance to augment the thrust of the prime thrust unit.

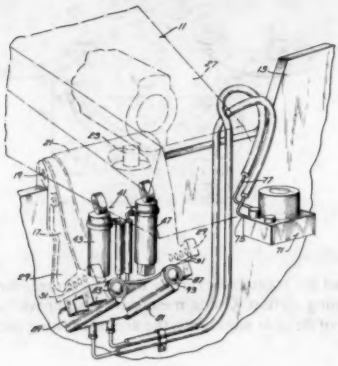
3,722,455
HYDRAULIC POWER TRIM AND POWER TILT SYSTEM FOR A MARINE PROPULSION DEVICE

Eugene C. Carpenter, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 23, 1971, Ser. No. 118,134
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 HT **16 Claims**

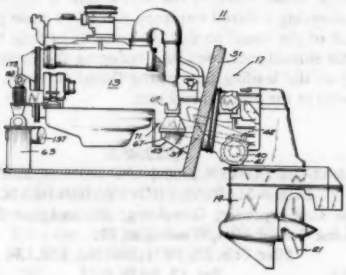
Disclosed herein is an outboard motor including a first extensible hydraulic cylinder means pivotally connected between a transom bracket and a swivel bracket to afford power tilting and, in response to the striking of an underwater obstacle, to afford energy absorption, together with a second extensible hydraulic cylinder means having an extensible part and mounted on the transom bracket with the extensible part positioned for engagement with the swivel bracket to afford

trim adjustment. The disclosed outboard motor also includes connection of the first and second extensible hydraulic cylinder means in parallel relation to an electrically operated reversible hydraulic pump and further includes an electrically operated normally closed valve controlling communication



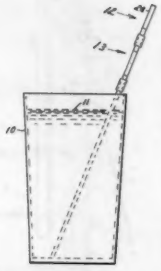
between the trimming hydraulic cylinder means and the hydraulic pump independently of the communication between the tilting hydraulic cylinder means and the hydraulic pump, together with a tilt control switch operable to actuate the hydraulic pump, and a trim control switch operable to actuate the hydraulic pump and to open the normally closed valve.

3,722,456
STERN DRIVE UNIT PROPELLER TRIMMING ARRANGEMENT
Ralph E. Lambrecht, and Harry Najimian, Jr., both of Lake Bluff, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Sept. 1, 1971, Ser. No. 177,070
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 R **32 Claims**



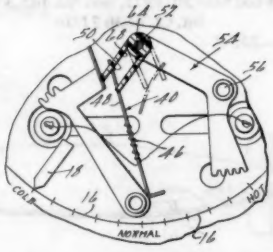
Disclosed herein is the combination of a boat hull and a stern drive unit which includes and is supported by an engine and which further includes a marine propulsion lower unit tiltable vertically and swingable horizontally independently of the engine, together with means mounting the stern drive unit on the boat hull including means for selectively vertically displacing or tilting the forward end of the engine relative to the rear of the engine.

3,722,457
CODED SWIZZLE-STICK
Daniel J. Hartinger, 1658 Mayfield Lane, Madison, Wis.
Filed Sept. 22, 1971, Ser. No. 182,719
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **8 Claims**



A highball stirring implement having color bands thereon and sleeves slidable thereover indicating, by the position of the sleeves relative to the bands, the type of drink or contents in an associated highball drinking glass.

3,722,458
INDICATOR MECHANISM
James A. Chiang, 38218 Avondale, Westland, Mich.
Filed Nov. 20, 1970, Ser. No. 91,407
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 **1 Claim**

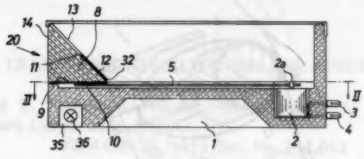


An indicator mechanism particularly useful in an automotive vehicle for indicating various engine operating parameters or conditions, for example, engine coolant temperature and engine oil pressure. The indicator mechanism includes an indicator with means pivotally mounting the indicator freely within the indicator mechanism. An actuating means is mounted in the indicating mechanism and it moves as a function of the parameter or condition to be indicated, and means couple the actuating means and the indicator for causing the indicator to remain in substantially the same position with respect to a scale over a substantial range of movement of the actuating means and, hence, over a substantial range of values of the parameter or condition to be indicated.

3,722,459
INDICATING INSTRUMENT
Willy Kisselmann, Grunwald Near Munich; Fritz Rumpelein, Munich, and Paul Kopf, Unterhaching, all of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed April 10, 1970, Ser. No. 27,267
Claims priority, application Germany, April 18, 1969, P 19 19 883.5
Int. Cl. G09f *9/00*
U.S. Cl. 116—129 R **16 Claims**

An indicating instrument wherein the housing accommodates a moving-coil instrument whose pointer travels along

one surface of an elongated prism. The one surface carries a straight scale and another surface of the prism is mirrored to reflect the images of the scale and of the tip of the pointer



toward the front side of the housing. At least some graduations of the scale constitute openings or cutouts which permit observation of the tip in corresponding angular positions of the pointer.

3,722,460

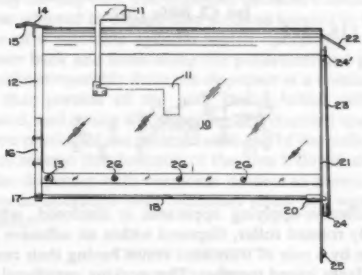
MAIL BOX SIGNAL

Robert E. James, Sr., 930 N. Phillips Rd., Route No. 7, Lima, Ohio

Filed May 17, 1971, Ser. No. 143,934

Int. Cl. G08c *5/00*

U.S. Cl. 116—132 **4 Claims**



The present invention relates to a rural mail box having a flap held over the back by means of a magnet until released by pressure from a rod actuated by the opening of the mail box door. Depending upon whether the back or the front of the positioned box is facing the residence of the owner, the outer surface of the back and/or the inner surface of the flap, when in upright position, or only the back side of the box, are covered with a highly visable color so as to become readily visable from a distance when the door of the box is opened and the flap moved from its standby position. After removing the mail from the box the flap is manually moved to the standby position where it is held by a magnet until the box is again opened. The contact between the flap and the rear surface of the box is protected from rain, snow, or the like by an overhanging shield.

3,722,461

SCORING COUNTER

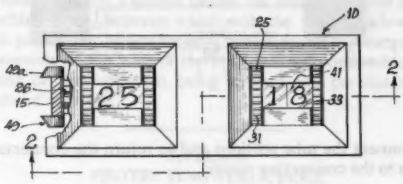
David L. Forman, Hewlett, N.Y., assignor to Sutra Import Corporation, Oceanside, N.Y.

Filed July 7, 1972, Ser. No. 269,522

Int. Cl. G06c *1/00, 27/00;* **G06m** *1/00*

U.S. Cl. 116—133 **5 Claims**

A device for keeping the scores of players engaged in competitive games or sports adapted to be flush-mounted on a suitable support, without the use of tools, for example, on the frame of a pool table. The device is readily assembled with



minimum labor cost, and the components are so designed as to allow the fabrication of counters for any number of players by simple multiplication of parts.

3,722,462

APPARATUS FOR COATING MATERIALS OF ALL KINDS WITH A PLASTIC COATING, IN PARTICULAR FOR IMPREGNATING WEBS OF INSULATING MATERIAL WITH ELECTRICALLY CONDUCTING PLASTIC DISPERSIONS

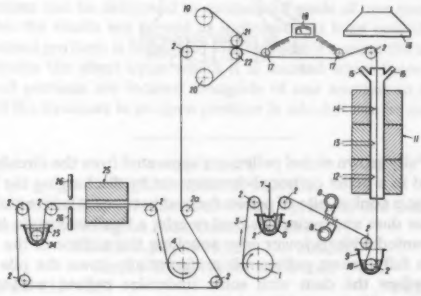
Alfred Pohler, Reutte, and Erich Hayek, Vienna, both of Austria, assignors to Metallwerk Plansee Aktiengesellschaft & Co. KG, Tirol and E. Schrack Elektrizitats Aktiengesellschaft, Wien, both of Austria

Filed Jan. 13, 1971, Ser. No. 106,097

Claims priority, application Austria, Jan. 16, 1970, 427

Int. Cl. B05c *11/00*

U.S. Cl. 118—5 **3 Claims**



Coating apparatus includes a vertically arranged multi-zone drying oven. The oven is separable along vertical sections thereof for easy access. Each oven zone has an electrical heating means which is controlled by a PID circuit.

3,722,463

TUBE COATING APPARATUS

Masao Kudo; Akihiko Okita; Kenziro Yoshimura, and Nobuo Niwa, all of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd. and Ajikawa Iron Works & Construction Company Limited, both of Osaka, Japan

Filed Aug. 17, 1971, Ser. No. 172,506

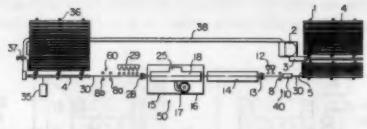
Claims priority, application Japan, Aug. 19, 1970, 45/73063

Int. Cl. B05c *11/122*

U.S. Cl. 118—6 **7 Claims**

A galvanizing apparatus includes means connecting individual lengths of tube sections by assembly of a connector

element therewith, means to convey the assembled sections through a plurality of treating stations, means to thereafter



disconnect the tube sections and to return the connector element to the connecting means.

3,722,464

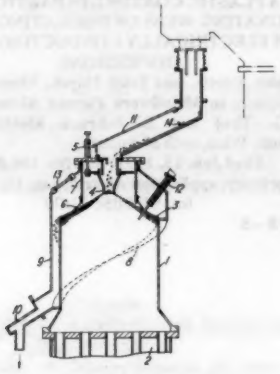
APPARATUS FOR COATING AND SEPARATING PELLETS

David Evans, Swansea, Wales, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed June 24, 1971, Ser. No. 156,288

Int. Cl. C23c *13/08*

U.S. Cl. 118—48 **1 Claim**



Fully grown nickel pellets are separated from the circulating load in a pellet carbonyl decomposer by discharging the load on to a conical pile of pellets formed between a horizontal circular dam and a circular feed nozzle, a flexible curtain being mounted with its lower edge touching the surface of the pile. The fully grown pellets roll preferentially down the pile and overflow the dam with some undersize pellets, which are separated by screening and returned to circulation.

3,722,465

SMOOTHING SCRAPER-COATING APPARATUS

Franz Krautzberger, Heidenheim, Germany, assignor to J. M. Voith, GmbH, Heindenhein, Germany

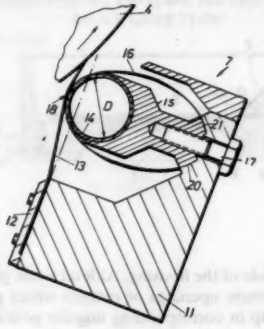
Filed March 16, 1971, Ser. No. 124,843

Claims priority, application Germany, March 17, 1970, P 20 12 598.8

Int. Cl. B05c *11/02, 3/02*

U.S. Cl. 118—123 **7 Claims**

The specification discloses a scraper, or skimming, blade arrangement for controlling the thickness of a layer of coating composition deposited on a running web. The blade extends pivotally attached to the rear of the frame. Part of the bed extends rearwardly the web and has one longitudinal edge fixed to a support beam on the side of the beam which faces the web. An inflatable tube between the beam and the blade is expansible by fluid pressure to flex the blade into operative engagement with the web downstream from the region of supply of the coating composition to the web. A leaf spring element interposed between the tube and the blade serves to distribute



the pressure of the tube along the blade so that the pressure with which the blade engages the web is substantially uniform along the full length of the blade.

3,722,466

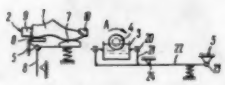
APPARATUS FOR APPLYING AN ADHESIVE ON UPPER MARGIN OF A SHOE UPPER

Boris Zakharovich Krolikov, Nevsky prospekt, 153, kv. 5; Jury Petrovich Krylov, ulitsa im. Bratiev Gorkushenko, 7, kv. 92, and Ilya Iosifovich Brod, prospekt Kosmonavtov, 52, korpus 1, kv. 117, all of Leningrad, U.S.S.R.

Filed July 14, 1971, Ser. No. 162,353

Int. Cl. B05c *1/02*

U.S. Cl. 118—212 **1 Claim**



An adhesive-applying apparatus is disclosed, wherein a positively rotated roller, disposed within an adhesive bath, is made up by a pair of truncated cones having their respective smaller faces joined together. The working peripheral surface of these cones has cut therein a helical thread, and the adhesive bath is resiliently mounted, for said roller to engage resiliently the last having the shoe upper supported thereabout, as this last is reciprocated relative to said roller.

3,722,467

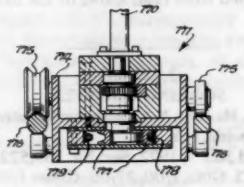
DEPOSITION APPARATUS

Peter D. Kaspar, Dover, Del., assignor to International Playtex Corporation, Dover, Del.

Division of Ser. No. 705,210, Feb. 13, 1968, Pat. No. 3,625,739. This application Dec. 9, 1970, Ser. No. 96,371

Int. Cl. B05b *15/04, 1/28*

U.S. Cl. 118—301 **8 Claims**



The apparatus includes a deposition arrangement including means to deliver a flowable material which in dry form pos-

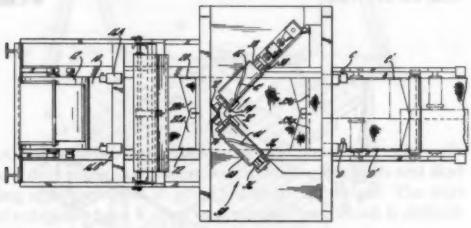
sesses elastomeric properties to a foraminous conveyor to provide a continuous foraminous film having elastomeric properties.

The deposition apparatus includes a centrifugal dish-like member adapted to deliver the flowable material in particularized form onto the foraminous forming surface.

3,722,468
TRANSVERSING MECHANISM FOR ADHESIVE APPLICATION

David L. Middleton, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 26, 1971, Ser. No. 192,011
Int. Cl. B05c 5/00
U.S. Cl. 118—315 9 Claims

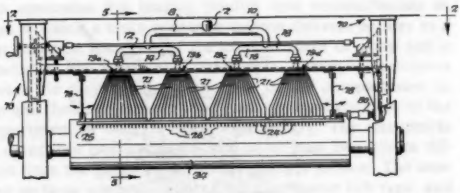


An automatic adhesive applicator for applying successive transverse adhesive strips on a continuously moving web. An adhesive dispenser is mounted for reciprocating movement along a predetermined path extending transversely of the continuously moving web. The dispenser includes a rotatable cam follower adapted to engage cam surfaces located in the outer surface of a rotatable cylinder which operates to drive the dispenser back and forth along the predetermined path. The cam surfaces operably drive the dispenser at a constant speed along that portion of the path during which adhesive is dispensed, and return the dispenser at a constant speed along the same portion of the path. At each end of the path, the cam surfaces reverse the direction of the cam follower and therefore the dispenser with harmonic motion to permit reliable high speed operation with minimum stress and wear on the equipment.

3,722,469
FOAM HEADER ASSEMBLY

Thomas S. Bartley, Mobile, Ala., and Paul A. Wagenknecht, Stafford Springs, Conn., assignors to International Paper Company, New York, N.Y.

Filed May 19, 1971, Ser. No. 144,924
Int. Cl. B05c 3/12
U.S. Cl. 118—414 5 Claims

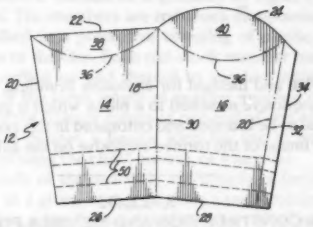


Apparatus for distributing coating and impregnates on a web of non-woven fabric, the apparatus including a distribution system in which the length of each branch pipe of the system is equal to the length of each other branch pipe, desirably the sum of the cross sectional areas of the branch pipes is equal to the cross sectional area of the pipe from which the branches are taken, the discharge ends of all of the branching pipes being arranged in a straight line in the same plane and discharging their contents above the nip between two rolls mounted together below the discharge ends of the branching pipes, between which rolls the web of non-woven fabric passes, and means for reciprocating such discharge ends transversely of the path of travel of said web onto which the coating or impregnate is being applied and parallel to the lengths of said rolls.

3,722,470
PROTECTING STRUCTURE

James P. Farrell, Orange, Calif., assignor to Fastmask Company, Orange, Calif.

Filed March 16, 1972, Ser. No. 235,805
Int. Cl. B05b 15/04
U.S. Cl. 118—505 3 Claims

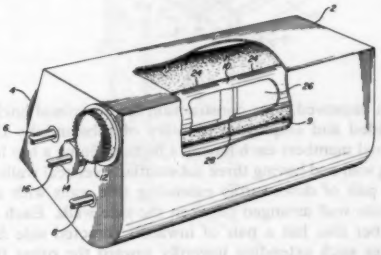


A protecting structure capable of being used to protect door knobs or the like during painting and other operations can be constructed using two sheets of cardboard secured along their side edges so that they can be bowed outwardly from one another. Two adjacent ends of the sheets are divided into terminal portions by curved, scored lines so that the terminal portions can be deformed to extend alongside of one another when the sheets are bowed as indicated. At least one of the terminal portions is formed so that its ends fit against the sheet opposite the sheet upon which it is located when these terminal portions are located alongside of one another so as to hold the structure in an open position in which it can be used.

3,722,471
TONER METER DEVICE

James C. Stoffel, Syracuse University, Syracuse, and John L. Brock, 1068 Pilgrim Pass, Ontario, both of N.Y.

Filed Dec. 23, 1970, Ser. No. 100,981
Int. Cl. G03g 13/00; B05b 5/02
U.S. Cl. 118—637 4 Claims



A cartridge dispenses toner through a plurality of chutes mounted inside the cartridge. The chutes communicate with openings in the body of the cartridge permitting measured amounts of toner to pass therethrough upon rotation of the cartridge by a suitable drive means.

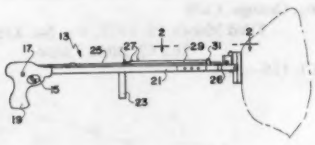
ERRATUM

For Class 118—246 see:
Patent No. 3,722,453

3,722,472
METHOD FOR BRANDING ANIMALS

Ronald E. Homestead, 2871 South Court, Palo Alto, Calif., and Thomas C. Poulter, Los Altos, Calif., assignors to said Homestead, by said Poulter

Filed May 21, 1971, Ser. No. 145,707
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 **16 Claims**

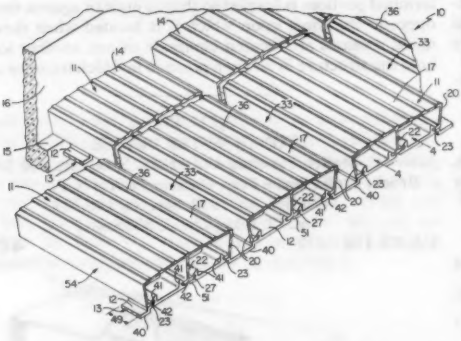


A device and method for explosive branding, comprising a formed explosive attached to a block which is pressed against an animal to be branded and detonated in this position to form a mirror image of the formed explosive on the animal.

3,722,473
FLOOR CONSTRUCTION AND MEMBER FOR MAKING SAME

Donald E. Vickstrom, and George F. Swenck, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Aug. 13, 1971, Ser. No. 171,528
Int. Cl. E04c *02/42*
U.S. Cl. 119—28 **14 Claims**

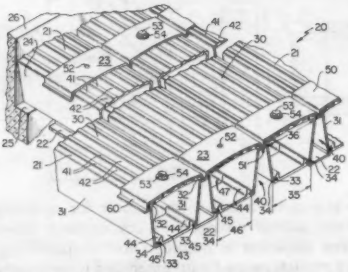


An improved floor construction for an animal enclosure is provided and employs a plurality of substantially E-shaped channel members each having a bight defining a top load-carrying wall and having three substantially vertical walls defined by a pair of downwardly extending side walls with an intermediate wall arranged between the side walls. Each channel member also has a pair of inwardly directed side fastening flanges each extending inwardly toward the other from the lower edge of an associated side wall and a central fastening flange adjoining the lower edge of the intermediate wall. Each channel member is made of a resilient material which enables the lower ends of an associated pair of its walls to be relatively spread apart at a location adjacent a set of associated fastening legs provided on an associated connector used to connect the channel member to an adjacent member and upon releasing the spread walls the normal resiliency of the channel member causes such walls to return to their initial positions so that their fastening flanges are hooked around the associated fastening legs. The three substantially vertical walls of each channel member provide improved support for its top wall and enable the forming of a floor construction of maximum area using a minimum amount of material for channel members and connectors.

3,722,474
CONNECTOR-SPACER AND FLOOR CONSTRUCTION USING SAME

Donald E. Vickstrom, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Aug. 13, 1971, Ser. No. 171,536
Int. Cl. A01k *01/00*
U.S. Cl. 119—28 **6 Claims**

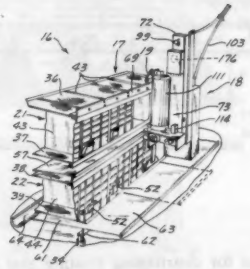


An improved floor construction and an improved top connector-spacer or connector for use in such floor construction is provided wherein the floor construction is comprised of a plurality of channel members arranged in parallel relation and has at least one bottom connector fastening the bottom portions of the channel members together in spaced relation to provide a substantially unobstructed passage between each immediately adjacent pair of channel members. The top connector holds the top portions of adjacent channel members in spaced relation and such top connector comprises a main body which has spacing means extending downwardly therefrom and between each immediately adjacent pair of channel members and also comprises means for fastening the top connector to associated ones of the channel members.

3,722,475
HUSBANDRY APPARATUS

Francis A. Wittern, Des Moines, and Warren D. Woodley, Adel, both of Iowa, assignors to Fawn Engineering, Des Moines, Iowa, by said Woodley

Filed Sept. 20, 1971, Ser. No. 181,912
Int. Cl. A01k *5/02*
U.S. Cl. 119—51.11 **16 Claims**



An automatic apparatus for distributing feed to a receptacle in each of a battery of animal cages during one pass of a car-

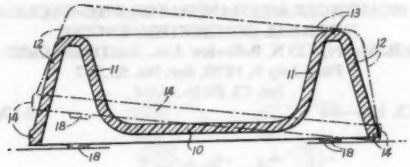
riage unit in front of the cages, then simultaneously flushing each receptacle and distributing water into receptacles during a return pass by the carriage unit, and wherein the feed is discharged substantially directly into each receptacle.

3,722,476

FEEDING BOWL FOR ANIMALS

Paul J. Van Ness, and William A. Van Ness, both of 42 Vincent Drive, Clifton, N.J.

Filed Sept. 16, 1971, Ser. No. 181,085
Int. Cl. A01k *5/00*
U.S. Cl. 119—61 **5 Claims**



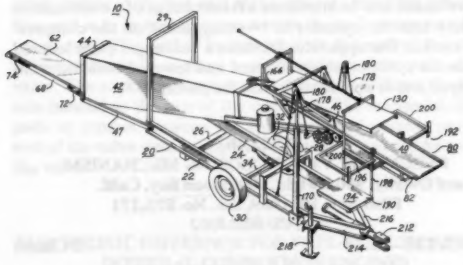
A bowl for feeding animals having bottom and side walls and a depending skirt composed of plastic, the walls and skirt being relatively thick to provide distributed weight. The skirt and side walls have a slope to provide a span which is difficult for the animal to grasp in its jaws.

3,722,477

POULTRY LOADING APPARATUS

Levon R. Weldy, R.R. 3, Box 175, and Olen Yoder, Jr., R.R. 2, Box 201, both of Goshen, Ind.

Filed March 11, 1971, Ser. No. 123,211
Int. Cl. A01k *29/00*
U.S. Cl. 119—82 **13 Claims**



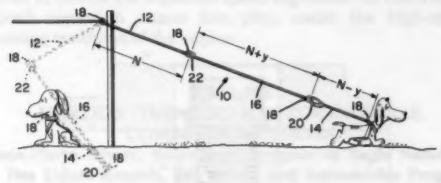
An apparatus for loading poultry into compartments or coops in which a main conveyor section delivers poultry to a point adjacent the door of the compartment or coop and a retractable and extensible telescopic conveyor extension delivers the poultry first to the rear of the compartment or coop and then progressively outwardly toward the door as the compartment or coop is filled with poultry. The retractable and extensible conveyor operates on at least two planes different from the plane of the main conveyor section. The conveyor sections are preferably of the continuous belt type, and the belt is continuous from the main section to and throughout the extension section. The main conveyor section has a relatively rigid frame, and the extension section has a retractable and extensible section which may be tilted angularly with respect to the main section to permit effective positioning of the extension section in a compartment or coop. The apparatus also includes a control station movable independently of the conveyors during the poultry loading operation.

3,722,478

TETHER ASSEMBLY

Robert G. Smith, P.O. Box 55, John Ct., Ironia, N.J.

Filed June 9, 1970, Ser. No. 44,759
Int. Cl. A01k *03/00*
U.S. Cl. 119—120 **7 Claims**



A tether assembly, for restraining an animal, child, or other object of restraint, formed of a plurality of rigid, elongated link members. The members are rod-stock components which may be sheathed in a protective covering of plastic, rubber, leather, nylon or the like. Each rod-stock member has linkage means for coupling an end thereof to another member, and each may be of the same length as another member of unique length. One of the linkage means at one end of one of the rod-stock members defines a handle loop for use in walking or otherwise exercising the child, animal, or whatever.

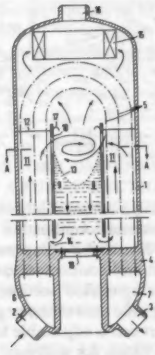
At either ends of the assembly are couplings for attaching the assembly to a given anchor of some fixed structure — i.e., an elevated line, a hook extending from the wall of a dwelling, a ground stake, or other anchor means — at a given elevation, or at ground level, respectively. Due to the rigidity of the members and swivel functioning of the couplings, a portion of the tether is forced to move away from the tethered object when the latter moves into proximity with the anchor means.

3,722,479

STEAM GENERATOR FOR PRESSURIZED WATER NUCLEAR REACTOR

Eberhard Michel, Bucher Str. 103, Nurnberg, Germany

Filed Feb. 22, 1971, Ser. No. 117,551
Claims priority, application Germany, Feb. 26, 1970, P 20 09 016.8
Int. Cl. F22b *1/16*
U.S. Cl. 122—34 **9 Claims**

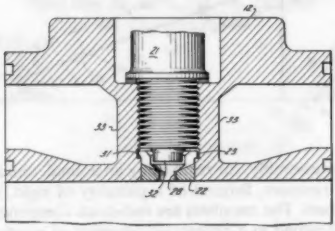


In a steam generator for pressurized water nuclear reactors having an upright U-tube bundle of heating surface members, there is provided in the center of the U-tube bundle, a cylindrical hollow chamber serving as preseparator of a steam-water mixture supplied tangentially thereto from a region of the generator wherein the vertically extending legs of the U-tube bundle are located.

3,722,480
ROTARY COMBUSTION ENGINE WITH IMPROVED FIRING CHANNEL

Murray Berkowitz, Woodcliff Lake, N.J., assignor to Curtiss-Wright Corporation

Filed Dec. 20, 1971, Ser. No. 209,996
Int. Cl. F02b 77/00
U.S. Cl. 123—8.01 6 Claims

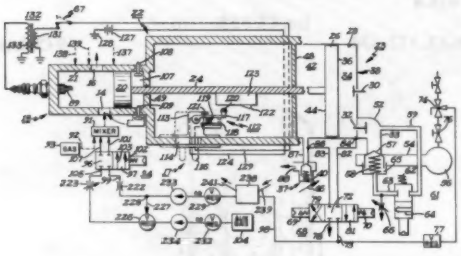


A rotary combustion engine having in its housing an insert coaxial with the spark plug, to define the shape and volume of the spark plug chamber and of the firing channel between the spark plug and the combustion chamber. The insert is formed of material of high heat resistance and high heat conductivity, and is contoured to provide smooth gas flow and to obviate areas of high heat concentration; the insert has its hoop strength relieved to enhance retention in the housing wall.

3,722,481
INTERNAL COMBUSTION ENGINE FUEL SUPPLY APPARATUS

Anton Braun, 6421 Warren Ave., Minneapolis, Minn.

Filed Nov. 12, 1971, Ser. No. 198,165
Int. Cl. F02b 13/06; F02n 7/00
U.S. Cl. 123—46 R 15 Claims

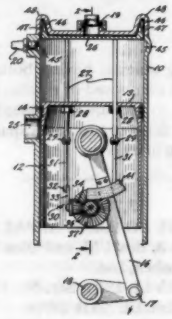


A system for supplying a substantially uniform combustible fuel mixture for an internal combustion engine includes a compressed air supply line and a compressed fuel gas supply line, each having a first end connected to its respective pressurized supply, a metering orifice portion, and a second end connected to an appropriate part of the engine. At least one of the metering orifice portions is adjustable for establishing various desired air-to-fuel ratios for delivery to the combustion cylinder. The system includes a pressure regulating apparatus in at least one of the lines, between its first end and its metering orifice portion for maintaining substantially equal pressures at all times in the respective supply lines immediately upstream of their respective metering portions. The respective supply line pressures immediately downstream of the metering orifices are also kept substantially equal by connection of both supply lines to a common conduit or mixing chamber. Preferably a pressure regulating valve of the air-loaded or dome-loaded type, which has a controlling pressure chamber and operates in response to changes in fluid pressure in such control chamber, is located in one line and has its control chamber connected to a sensing means so the chamber pressure has a predetermined relationship at all times to the pressure in the other supply line. A temperature control device may also be used in one or both lines to prevent undesired variations in air or fuel gas temperatures which could adversely affect the uniformity of the combustible mixture at different times during operation.

3,722,482
SCAVENGER MECHANISM FOR TWO-CYCLE INTERNAL COMBUSTION ENGINE

James R. Moore, 623 N. Belleview Ave., San Dimas, Calif.

Filed July 9, 1970, Ser. No. 53,367
Int. Cl. F02b 33/04
U.S. Cl. 123—66 6 Claims

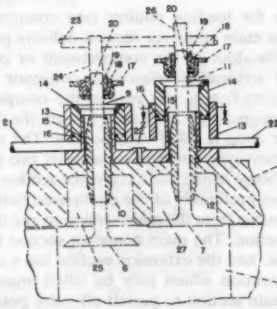


Apparatus adapted to be operated by the piston rod of an internal combustion engine to remove foul air and unburned fuel from the cylinders substantially at the completion of the power stroke and to introduce a fresh charge of a combustible mixture into the cylinder to be compressed on the compression stroke. The apparatus includes a scavenger plate located within the cylinder which is raised and lowered both independently of and in conjunction with the piston.

3,722,483
PNEUMATIC VALVE CLOSING MECHANISM

Howard Overby, 900 Dwight, Half Moon Bay, Calif.

Filed Nov. 10, 1969, Ser. No. 875,171
Int. Cl. F01l 9/02
U.S. Cl. 123—90.14 3 Claims



This invention consists of an air cylinder that encompasses the upper portion of each valve stem and guide on an internal

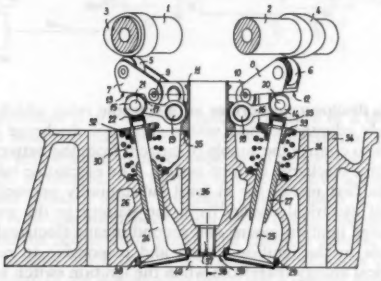
combustion engine. The air cylinders are provided with annular pistons. The upper end of each valve stem is provided with a dish-shaped washer that will rest on the top of a piston when the valve is open and will be forced upward by the top of the piston by the air in the cylinder to urge the valve toward its closed position.

3,722,484

DEVICES FOR CONTROLLING THE VALVES OF INTERNAL COMBUSTION ENGINES

Amedee Gordini, Viry-Chatillon, France, assignor to S.A. Gordini Automobiles, Viry-Chatillon (Essone), France

Filed Jan. 14, 1971, Ser. No. 106,390
Claims priority, application France, Jan. 15, 1970, 7001376
Int. Cl. F01l *1/04, 1/18*
U.S. Cl. 123—90.27 **4 Claims**



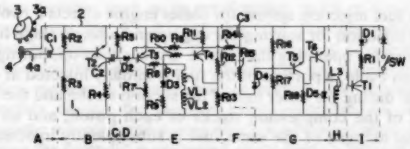
A device for controlling the valves of an internal combustion engine having overhead valves comprises a control cam, and two oscillating rockers for each valve. The free end of each rocker is disposed between the cam and the end of the valve stem. The free end of the rocker in contact with the cam has a roller which is in rolling contact with the cam. The lower planar surface of this rocker is in contact with the spherical head portion at the free end of the other rocker. This spherical free end is in in turn in contact with the end or tappet of the valve stem. The rocker in contact with the end of the valve stem oscillates in a plane perpendicular to the axis of the valve. The rocker in contact with the cam oscillates about an axis parallel to the axis of the camshaft. The mid-point of the path of contact between the spherical head portion and the end of the valve stem is disposed substantially along the axis of the valve.

3,722,485

ELECTRONIC GOVERNOR FOR FUEL-INJECTION TYPE INTERNAL COMBUSTION ENGINES

Yoshio Ohtani, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed March 9, 1971, Ser. No. 122,472
Int. Cl. F02d *5/02*
U.S. Cl. 123—102 **2 Claims**



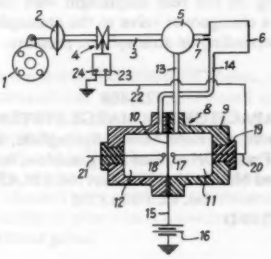
An electronic governor for fuel-injection type internal combustion engines, in which the number of component parts is minimized, the time constant is enlarged in the output voltage integrating circuit in order to eliminate the possibility of "-hunting" phenomenon and thus to secure a stable state under the low-speed running condition of the engine, the speed regulation, that is, the rate of change in fuel regulating rod position for changes in the rotational speed of the engine is therefore expanded for the low-speed range, and a signal arising from the displacement of the fuel regulating rod is applied, as in positive feedback, to the rotational speed setting circuit in order to narrow the expanded speed regulation, so that a small speed regulation comes into play, under the high-speed running condition of the engine.

3,722,486

IGNITION TIMING DEVICES FOR INTERNAL COMBUSTION ENGINES

Jean-Pierre Rivere, Billancourt, assignor to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris

Filed Oct. 29, 1971, Ser. No. 193,779
Int. Cl. F02p *5/04*
U.S. Cl. 123—117 A **4 Claims**



In this device for automatically adjusting the advance and/or retard of the ignition system of internal combustion engines, a solenoid valve is interposed between the corresponding advance and/or retard control capsule connected to the engine induction manifold and to the distributor of the ignition system, a buffer capacity, an output limiting member interposed between said capacity and said manifold, and a pressure-responsive electric switch connected to said manifold and also to said buffer capacity so as to act in one or the other direction as a function of variations in a differential pressure for closing during a predetermined time period, by means of said output limiting member, and/or said buffer capacity at least one electric contact controlling said solenoid valve.

3,722,487

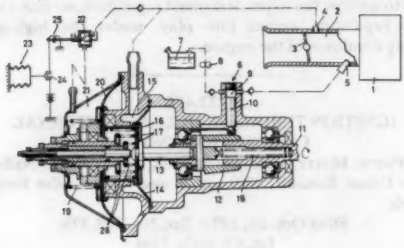
APPARATUS FOR COMPENSATION OF THE OPERATION OF A FUEL INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yasumichi Ohama, Tokyo, and Hiroshi Kogure, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1971, Ser. No. 195,181
Claims priority, application Japan, Nov. 30, 1970, 45/104879
Int. Cl. F02m *31/00;* **F02d** *1/04*
U.S. Cl. 123—140 MP **6 Claims**

A fuel injection device for an internal combustion engine is subjected to the action of two spring units mounted in a suction chamber connected to the suction inlet leading to the engine such that the first spring unit becomes inoperative when the engine is under high load while the resilient action of the second spring unit varies with atmospheric pressure change. The suction chamber has front and rear diaphragm walls

against which the second spring unit permanently bears, whereas the first spring unit is fixedly supported at its back end while its front end bears against the front wall when the suction pressure is high during low engine load and loses contact therewith when the suction pressure is low during high engine load. At the back of the suction chamber is a further chamber acting on the rear diaphragm wall and selectively connected by a changeover valve to the atmosphere or to the suction inlet depending on atmospheric pressure.



3,722,488

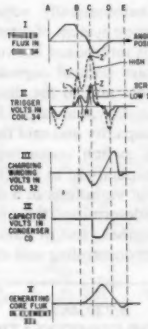
CAPACITOR DISCHARGE SYSTEM

Thomas E. Swift, 69 Field Street, Springfield, and Elwin J. Brayley, 11 Fraser Drive, East Longmeadow, both of Mass.

Filed March 22, 1971, Ser. No. 126,431

Int. Cl. F02p *3/06*

U.S. Cl. 123—149 D **3 Claims**



A breakerless ignition system of the capacitor discharge type for an engine is disclosed with the energy being supplied by a simplified magneto having a magnetic structure energized by a rotor with a single permanent magnet group to create a charging current for the capacitor and a trigger current to change the conductance state of a silicon-controlled-rectifier to discharge the current stored in the capacitor into an ignition coil to provide the ignition spark in the secondary thereof. The magnetic arrangements between the parts provide an automatic timing advance with increase in speed of the engine. Improved means are provided for temperature compensation by a bifilar winding on the trigger coil of positive temperature coefficient wire of nickel or the like. Anti-reverse rotation protection is also provided.

3,722,489

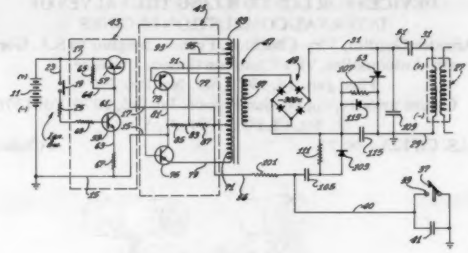
ELECTRONIC RELAY AND IGNITION SYSTEM UTILIZING SAME

Homer E. Howard, Costa Mesa, Calif., assignor to Howard Associates, Inc., Costa Mesa, Calif.

Filed March 13, 1969, Ser. No. 806,998

Int. Cl. F02p *3/06*

U.S. Cl. 123—148 E **11 Claims**



This disclosure describes an electronic relay which is particularly adapted for use with a capacitor discharge ignition system to control the supply of current from the battery to the capacitor discharge ignition system. The electronic relay may include first means for at least substantially preventing the flow of electrical energy from the battery to the capacitor discharge ignition means and second means electrically connectible to the ignition switch and responsive to receiving electrical energy therefrom when the ignition switch is closed to permit the flow of the electrical energy from the source of electrical energy to the capacitor discharge means.

3,722,490

METHOD OF AND APPARATUS FOR INJECTING FUEL INTO A DIESEL ENGINE

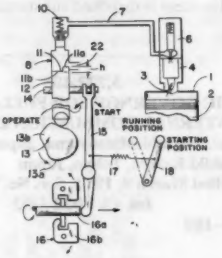
Kenji Araya, Kameoka; Akihiro Enomoto, Kyoto; Akira Nishina, Otsu, and Masahiro Yamaguchi, Kameoka, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1969, Ser. No. 872,825

Claims priority, application Japan, Nov. 15, 1968, 43/83391

Int. Cl. F02b *3/00*; F02n *17/00*

U.S. Cl. 123—179 L **10 Claims**



A fuel injection system for diesel engine effects a two-stage fuel injection for starting the engine and a single stage fuel injection for operating the engine. During start-up, during each piston cycle, a portion of the fuel is initially injected at a first point during the latter half of the suction stroke and the initial half of the compression stroke of each piston, and an additional amount of the same fuel is subsequently injected at a second point near the end of the same compression stroke of each piston. When the engine has reached a predetermined number of rpms the regular operation of the engine continues with the fuel being injected only in a single stage at approximately the same point in the cycle as the second injection of fuel in the start up procedure.

3,722,491

APPARATUS FOR INSURING AUTOMATIC CLOSURE OF AN ENGINE THROTTLE VALVE UPON RELEASE OF THE ACCELERATOR PEDAL

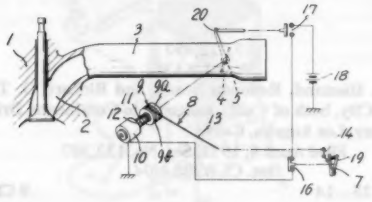
Noriyuki Maeda, Sengoku, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 15, 1970, Ser. No. 98,379

Claims priority, application Japan, Dec. 16, 1969, 44/100574

Int. Cl. F02b 77/00

U.S. Cl. 123—198 D 9 Claims



An apparatus is provided for insuring closure of a throttle valve in a suction passage in an internal combustion engine when an acceleration member such as an acceleration pedal or the like is released. The throttle valve is urged by a spring to its closed position and a normally closed clutch is incorporated in an operation mechanism which couples the throttle valve and the acceleration pedal. The clutch is opened by an electro magnet when both a first detecting switch is closed upon release of the acceleration pedal and a second detecting switch is closed when the throttle valve remains in its open position.

3,722,492

APPARATUS FOR FORCIBLY CLOSING AN ENGINE THROTTLE VALVE

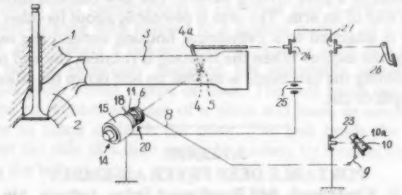
Yasuo Shibata, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1970, Ser. No. 100,965

Claims priority, application Japan, Dec. 26, 1969, 44/104280

Int. Cl. F02b 77/00

U.S. Cl. 123—198 R 9 Claims



An apparatus for forcibly closing a throttle valve in a suction passage of an internal combustion engine, the throttle valve being movable to open and close by an acceleration operation member such as an acceleration pedal or the like. The apparatus for forcibly closing the throttle valve is mounted on one side of the throttle valve, and is operated when the throttle valve is not closed and the acceleration operation member is released from operation. The apparatus for forcibly closing the throttle valve comprises an electromagnetic solenoid with a core which is advanced with rotation when the solenoid is energized, there being a first detecting switch which is closed when the acceleration operation member is released from operation and a second detecting switch which is closed when the throttle valve is in its open position, the two switches being interposed in series in an electrical circuit containing the solenoid and an electric source.

3,722,493

ROTARY PISTON INTERNAL COMBUSTION ENGINE

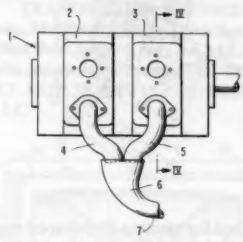
Hans Otto Hartmann, Wurttembergstasse 110, Stuttgart-Unterturkheim, and Karl-Walter Schmidt, Kappelbergweg 14, Beutelsbach, both of Germany

Filed March 10, 1971, Ser. No. 122,691

Claims priority, application Germany, March 11, 1970, P 20 11 574.6

Int. Cl. F02b 53/00

U.S. Cl. 123—8.07 28 Claims



A rotary piston internal combustion engine, particularly of trochoidal construction, which is composed of at least two units, each including a piston and a housing casing, and in which both the inlet channel as also the exhaust channel are arranged in each unit within the area of a zone of the housing casing near the engine axis; the exhaust pipes connected to each exhaust channel are combined at substantially the same height into a common pipe which provides an afterburning effect for the exhaust gases.

3,722,494

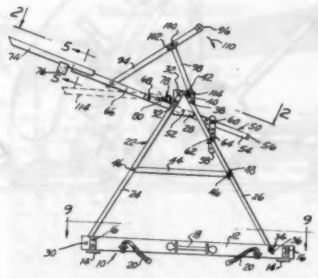
MECHANICAL BALL THROWING DEVICE

James T. Slevin, 9361 Memorial, Detroit, Mich.

Filed March 8, 1971, Ser. No. 121,898

Int. Cl. F41b 3/02

U.S. Cl. 124—7 4 Claims



A mechanical throwing ball device having a base supporting thereon a pair of spaced frame members. An elongated head, adjustably supported between the frame members, has thereon a pivoted pitching arm. A resilient member is pivotally connected between the rear end of the pitching arm and the elongated head. A cocking arm pivotally attached at one end to the pitching arm, is supported by a link pivotally connected between the pitching arm and the frame. The device is fully collapsible so that it can be compacted to facilitate storage and transportation.

3,722,495

DRIVE MECHANISM FOR AUTOMATICALLY VARYING THE VERTICAL AND HORIZONTAL THROWING ANGLES OF A TARGET TRAP

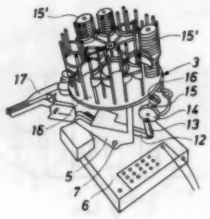
Ib Schreiner Hansen, Aaso, 5953 Tranekaer, Denmark

Filed Oct. 21, 1970, Ser. No. 82,597

Claims priority, application Sweden, Oct. 21, 1969, 14432/69

Int. Cl. F41b *3/04*

U.S. Cl. 124—9 **3 Claims**



A trap is described for ejecting disc-shaped members, otherwise shown as clay pigeons. The trap has a throwing arm for the clay pigeons, said arm being pivotably mounted on a frame which is oscillated about a vertical axis by an electric motor via a transmission mechanism and is further oscillated about a horizontal axis by another electric motor via another transmission mechanism. The latter mechanism is adapted to control the first-mentioned motor in such a way that this motor is intermittently stopped and started, whereby an irregularity is introduced in the pigeon throwing cycle.

3,722,496

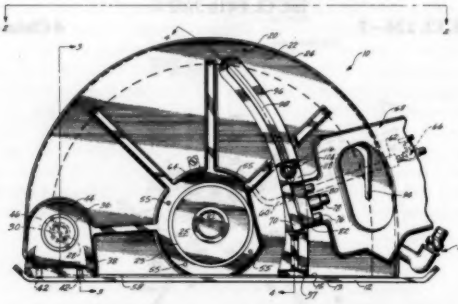
CONCRETE CUTTING HAND SAW

Albert Schuman, 3424 Marina Drive, Santa Barbara, Calif.

Filed Jan. 28, 1971, Ser. No. 110,502

Int. Cl. B28d *1/04*

U.S. Cl. 125—13 R **2 Claims**



A concrete cutting hand saw has a base plate for engaging a concrete surface to be cut. The saw is driven by a motor having a housing and a rotatable saw blade supporting spindle. A shroud member is adapted to receive a circular saw blade therein and to mount the motor housing thereto with the spindle extending into the shroud member. The shroud member is arranged to enclose opposite sides of the saw blade engaged with the spindle over a substantial portion of the area of the blade. Means connect the shroud member to the base plate for hinging motion about an axis parallel to the spindle axis and spaced therefrom. An elongate shroud guide, having an elongate arcuate slot curved concentric to the hinge axis, is fixed to the base plate. Selectively operable means for fixing the shroud member at a desired angular position relative to the base plate include a connecting member removably positioned through the arcuate slot and matable with a socket defined in the shroud member. The connecting member is fully releasable from the socket and the slot so that the shroud member is hingeable relative to the base member through an arc greater than that subtended by the slot. In this manner the saw blade may be easily inserted into the shroud member into coaxial alignment with the spindle.

3,722,497

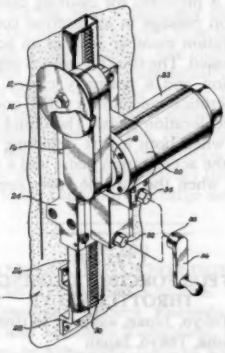
WALL SAW

James C. Hiestand, Redondo Beach, and Richard O. Theis, Studio City, both of Calif., assignors to Continental Drilling Company, Los Angeles, Calif.

Filed April 8, 1971, Ser. No. 132,387

Int. Cl. B28d *1/04*

U.S. Cl. 125—14 **9 Claims**



A saw for cutting openings in walls and other flat surfaces is disclosed. The saw is mounted on a trolley which rides on a track attached to the flat surface, and is moved along the track by means of a gear driving device. The saw blade is mounted at one end of an arm. The arm is pivotable about its other end, which is attached to a cylindrical housing around the output shaft of the motor. When the housing is rotated, the end of the arm holding the saw blade is moved up and down for adjusting the depth of cut.

3,722,498

PORTABLE DEEP FRYER ASSEMBLY

Clyde H. Kimbrough, 449 Brookwood Drive, Auburn, Ala.

Filed Aug. 12, 1971, Ser. No. 171,160

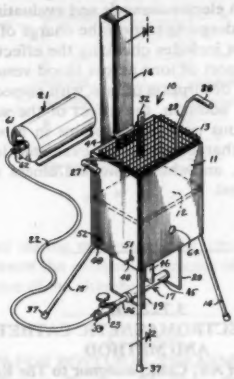
Int. Cl. F24c *5/20*

U.S. Cl. 126—38 **6 Claims**

This deep fryer assembly comprises a plurality of parts which are quickly attachable to one another to make up a deep fryer assembly. The principal part is a vertically extending tube of rectangular section in which is disposed intermediate its height a thick heat plate adapted at the top of the tubular member to contain the cooking oil or shortening and into which a basket can be dropped and lifted out of the oil with its contents after the frying has been done.

The legs are detachably connected, being formed of two parts and such as to fit snugly within the lower open end of the tubular member and retained therein by cleats or clip fasteners. A chimney is detachably connected to the rear of the tubular member and has an opening entering an opening in the flame chute portion of the tubular member. A jet burner is

detachably supported and depending from the lower end of the tubular member by U-shaped rod members having elongated ends adapted to be detachably extended through openings adjacent the lower edge of the tubular member. A gas pressure source includes a container having a regulator



and a hose connection to a shut-off valve on the burner. A hot high pressure blue flame is directed into the lower end of the tubular member and against the thick heat plate. The flame is covered by the depending shield portion of the tubular member and cannot be emitted from the sides of the plate.

3,722,499

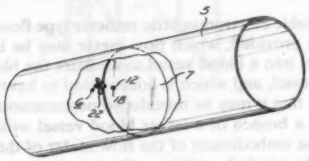
BOLT AND DAMPER CONSTRUCTION

Serge Lukjan, Rte. 2, Evergreen Rd., Frankfort, Ky.

Filed March 25, 1971, Ser. No. 128,009

Int. Cl. F23l *3/00*

U.S. Cl. 126—292 **17 Claims**



A novel bolt construction is provided that is self-locating and self-locking with respect to a mating portion of a workpiece, particularly a flat-surfaced workpiece such as a plate. The bolt is especially designed for adjustably securing a damper plate within a pipe or duct. The bolt has a cut-away section to receive an edge of a plate and hook or anchoring means to catch or latch the plate. The bolt holds the plate against the side of a duct or the like solely by tension exerted along the bolt.

3,722,500

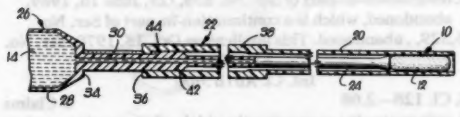
ABORTIVE DEVICE AND METHOD

Ralph R. Robinson, P.O. Box 668, Middlesboro, Ky.

Filed Dec. 29, 1970, Ser. No. 102,448

Int. Cl. A61b *19/00;* **A61f** *5/46*

U.S. Cl. 128—1 R **9 Claims**



Premature termination of pregnancy is effected by insertion of a hollow, distensible body of elastomeric material into the uterus to stimulate muscular activity sufficiently to induce menstruation and thereby cause spontaneous expulsion of the nonviable embryo. In one form of the invention, after the body is inserted, it is filled with a substance to effect the distension thereof. In another embodiment, the body is provided with an incrustation and then charged with a pressurized substance before insertion. The incrustation dissolves in the uterus, permitting the substance to expand and distend the body to a size which precludes its expulsion until shedding of the endometrium and discharge of the implantation therewith.

3,722,501

TRANQUILIZING DEVICE

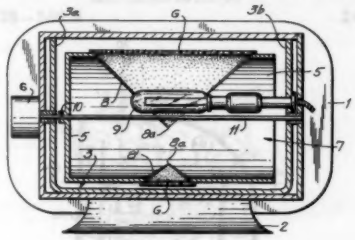
Rene Derouineau, Moulin de Pelissey, Gradignan, France

Filed Feb. 3, 1971, Ser. No. 112,183

Claims priority, application France, Feb. 11, 1970, 7004759

Int. Cl. A61h *5/00;* **F21p** *3/00;* **G09f** *11/10*

U.S. Cl. 128—1 C **7 Claims**



The invention relates to a therapeutic device which serves to tranquilize the user by the effect of a timed presentation of a varying size colored image and more particularly includes an internally illuminated cylinder having a pair of spaced triangular openings covered with different colored translucent sheets which are successively moved past a viewing opening to be observed by the viewer.

3,722,502

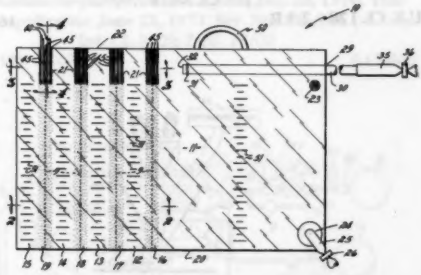
MULTIPLE LIQUID SAMPLE COLLECTION APPARATUS

Sidney Besuner, 319 Rossford Avenue, Ft. Thomas, Ky., and Richard L. Pardun, 11391 Kenshire Drive, Cincinnati, Ohio

Filed Oct. 18, 1971, Ser. No. 190,143

Int. Cl. A61b *5/00*

U.S. Cl. 128—2 F **9 Claims**



A liquid sample collection apparatus which includes a collection receptacle with a plurality of joined but separable sample collection units. A liquid transmitting tube may be selectively positioned to discharge into a desired collection unit, without exposure to atmosphere and without sample cross-contamination. The tube has an outlet which is insertable

through internal openings to the respective units. When a sample has been collected in one unit, the flow of fluid is stopped and the outlet end of the tube is withdrawn from the particular unit, but remains within the overall receptacle. The opening between the filled unit and its adjacent unit is then sealed, and the filled unit is separated from the receptacle. The whole system remains sealed to external contamination through successive sample collections and separations.

3,722,503

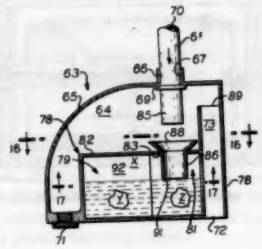
APPARATUS FOR COLLECTION OF URINE IN FEMALES

Jack H. Hovick, Huntington Beach, Calif., assignor to James B. Gambrell, a part interest

Division of Ser. No. 703,700, Feb. 7, 1968, Pat. No. 3,583,388, which is a continuation-in-part of Ser. No. 451,495, April 28, 1965, abandoned. This application Dec. 30, 1970, Ser. No. 102,866

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 F **7 Claims**



Apparatus for collecting a midstream urine specimen from a female is described which does not require professional help. The apparatus combines a urinary guide having a urinary passageway, means on the guide to align the passageway with the female urethra so that a minimum of labial and vaginal secretions are entrained and a collector which isolates a predetermined initial volume of the micturition so that the urine sample collected for analysis is uncontaminated for all practical purposes.

3,722,504

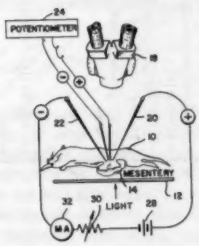
METHOD OF SCREENING SUBSTANCES FOR USE IN THE TREATMENT OF CIRCULATORY SYSTEM DISEASES

Philip Nicholas Sawyer, 606 Third St., New York City, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,649

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 R **16 Claims**



A method as set forth for screening chemical agents and compounds to determine their usefulness in the treatment of circulatory system diseases and to enable distinguishing the anticoagulant and antithrombotic characteristics of the same. The method consists of a plurality of interrelated steps including the evaluation of the agent or compound on an exposed laboratory animal mesentery. Also included are tests on streaming potential in blood vessels, both in vivo and in vitro. In addition, the method includes checking the effect of the tested substances on electro-osmosis and evaluating the effect of the substance undergoing test on the charge of blood cells. Still further, the test includes checking the effect of the substance on the transport of ions across blood vessel walls and on the sorption and desorption of ions with respect to the circulatory system. In addition, the effect of the substance on destruction of various cells and proteins in blood is determined. The above characteristics are evaluated to determine the antithrombotic, antiatherogenic usefulness of the substance undergoing test.

3,722,505

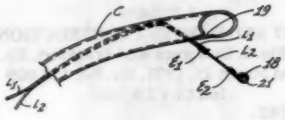
ORIENTABLE ELECTROMAGNETIC CATHETER PROBE AND METHOD

Alexander Kolin, Bel Air, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed July 2, 1970, Ser. No. 52,032

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.05 F **11 Claims**



An orientable electromagnetic catheter type flow meter and method are provided, which flow meter may be introduced, for example, into a blood vessel to measure the blood flow in the blood vessel, and which is constructed to have a minimal diameter so that it may be introduced percutaneously, for example, into a branch of a larger blood vessel with minimum damage. One embodiment of the flow meter of the invention to be described includes a thin resilient probe having an angulated end portion so as to place its pick-up electrodes adjacent the inner surface of the wall of the blood vessel diagonally or diametrically across the blood vessel from one another. The aforesaid flow meter in one embodiment is constructed so that its probe may be easily turned while in the blood vessel to different orientations with respect to an external magnetic field, in order first to establish a proper base line, and then to establish optimal orientation for flow sensing. In another embodiment the external field is turned, and in yet another embodiment the animal or human subject is turned together with the flow probe relative to the external magnetic field.

3,722,506

ROLLING SEAL SPIROMETER

Robert D. McMillan, Jr., Houston, Tex., assignor to Airco Inc., New York, N.Y.

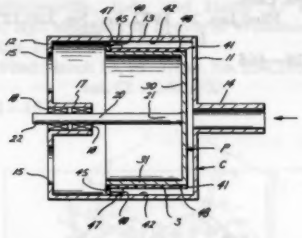
Continuation-in-part of Ser. No. 838,725, June 16, 1969, abandoned, which is a continuation-in-part of Ser. No. 646,529, , abandoned. This application Oct. 15, 1970, Ser. No. 81,127

Int. Cl. A61b *5/00*

U.S. Cl. 128—2.08 **2 Claims**

A spirometer for measuring the tidal volume and/or expiratory breathing rate of human lungs including a movable piston positioned within a chamber; the piston being responsive to an

expired breath which enters one end of the chamber. A unique U-shaped rolling seal is provided having extremely minute



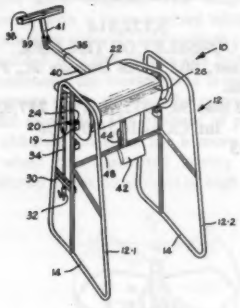
friction losses during movement and which effectively seals the area between the external perimeter of the piston and the internal surface of the chamber.

3,722,507

APPARATUS FOR POSTURAL TREATMENT OF HUMANS

Frans Engelbertus Krause, 75 Steyn Street, Hennenman, O.F.S., Republic of South Africa

Filed Sept. 7, 1971, Ser. No. 178,334
Int. Cl. A61f *5/00*
U.S. Cl. 128—68 **2 Claims**



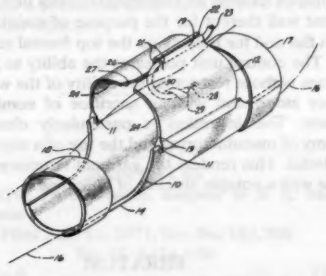
An apparatus for effecting postural treatment of a human by positioning the human in an inverted position at the hip joint on a platform which is pivotally mounted on a supporting structure.

3,722,508

INFUSION GUARD AND IMMOBILIZER

Donald B. Roberts, 355 S. 8th Ave., Pocatello, Idaho

Filed Oct. 26, 1970, Ser. No. 83,898
Int. Cl. A61m *05/00*
U.S. Cl. 128—133 **13 Claims**



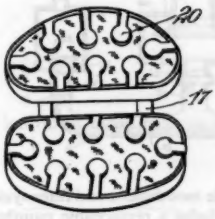
A combined immobilizer and guard particularly useful for intravenous infusions or the like is described in several embodiments. The immobilizer is a rigid member having one surface conforming to a portion of a limb spanning a joint, such as, for example, an elbow, wrist or ankle. Velcro hook and eye straps are employed for fastening the immobilizer to a limb or extremity. The infusion guard comprises an arch extending from one side of the immobilizer to the other side and connected thereto by complementary connectors running along the length of he immobilizer and the guard. The guard includes means for clamping an intravenous tube thereto and a slit for passing and protecting the loop of tubing between the clamp and an intravenous needle. The guard prevents either an inadvertent pull on the tubing or a blow at the infusion site from dislodging the needle or causing infiltration.

3,722,509

NASAL FILTERS

Joseph A. Nebel, 15630 Dobson Avenue, Bolton, Ill.

Filed Jan. 5, 1971, Ser. No. 104,065
Int. Cl. A62b *23/06*
U.S. Cl. 128—140 N **2 Claims**



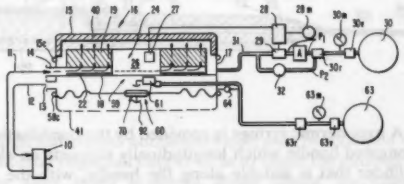
A nasal filter composed of companion pads of porous textile material, each pad secured in a reinforcing peripheral band. Outward base guards are carried by the pads to check their insertion into the nostrils beyond a prescribed extent. The pads are adapted for impregnation with a volatile solution, and valves are applied to the inner surfaces of the pads for the absorption of vapors from the solution on inhalation, but check the emission of such vapors on exhalation. Modified bands have perforations for the passage of vapors in outward direction on inhalation.

3,722,510

SAFETY APPARATUS FOR OXYGEN SUPPLY SYSTEM

Frederick A. Parker, Broomall, Pa., assignor to Biomarine Industries, Devon, Pa.

Continuation-in-part of Ser. No. 6,387, Jan. 28, 1970. This application June 23, 1971, Ser. No. 155,906
Int. Cl. A62b *7/10, 19/00*
U.S. Cl. 128—142 **6 Claims**



There is disclosed a safety device for use in a pulsed oxygen system for preventing a rapid build-up of partial oxygen pressure causing oxygen toxicity in the event a normally closed (or open) solenoid control oxygen supply valve fails and remains or sticks open. Following the regulator and shutoff valve on the oxygen circuit from a high pressure oxygen supply is a

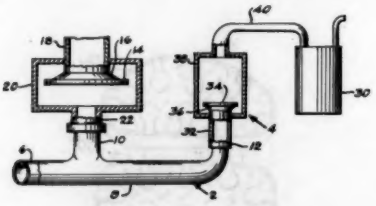
restricted passageway means which may be either an orifice or a capillary tube. Intermediate the restricted passageway means and the control valve is an accumulator means so that in the event the control valve fails and sticks open, the oxygen is admitted to the gas system at a metered rate. However, this rate is sufficient to supply the gas circuit with adequate oxygen when the valve is pulsed open.

3,722,511

MOUTHPIECE AND FILTERING SYSTEM

Alvin S. Blum, Coral Gables, Fla., assignor to Ohio Nuclear, Inc., Mentor, Ohio

Filed March 6, 1969, Ser. No. 804,873
Int. Cl. A61b 6/10
U.S. Cl. 128—147 **1 Claim**



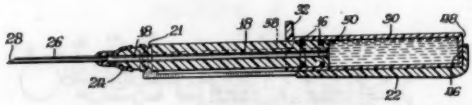
A replaceable mouthpiece and filter system for a gas supply means that includes a replaceable mouthpiece connected to an input means and an output means, and a filtering device connected to the output means for filtering exiting gases. The replaceable mouthpiece includes an input channel and an output channel. The replaceable mouthpiece includes that portion of the system which is common to entering and exiting gases. The filtering means removes radioactive gas from exhaled air, preventing contamination of the environment.

3,722,512

ONE HAND INJECTOR

Gary L. Hein, and Roger R. Larson, both of Decatur, Ill., assignors to Lincoln Laboratories, Inc., Decatur, Ill.

Filed Aug. 5, 1970, Ser. No. 61,121
Int. Cl. A61m 5/22, 5/32
U.S. Cl. 128—220 **11 Claims**



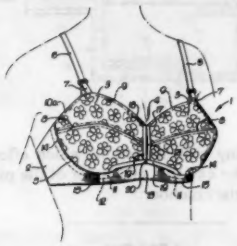
A hypodermic syringe is provided by the combination of an elongated handle which longitudinally supports an elongated cylinder that is slidable along the handle, with the injector needle being connected to a piston that is fixed with respect to the handle and is located within the cylinder. An abutment flange is located on the handle to limit rearward movement of the elongated cylinder to prevent the cylinder from disengaging the piston and to limit the amount of liquid that can be injested into the cylinder. The handle has a split portion for releasable engagement with the mounting for the needle.

3,722,513

UNDERWIRE BRA HAVING SELF-ADJUSTING FIT

Olga Erteszek, Los Angeles, Calif., assignor to Olga Company, Van Nuys, Calif.

Filed Jan. 24, 1972, Ser. No. 220,227
Int. Cl. A41c 3/00
U.S. Cl. 128—465 **8 Claims**



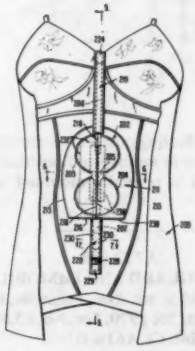
An underwire brassiere having increased comfort through responsive adaptability to breast variations, in both cup configuration and location, while affording underwire separation and uplift support characteristics ordinarily associated with an underwire brassiere.

3,722,514

CORSELET OR THE LIKE

Henry M. Herbener, 803 North Dawson St., P.O. Box 1477, Thomasville, Ga.

Filed May 30, 1972, Ser. No. 257,534
Int. Cl. A41c 5/00, 1/08
U.S. Cl. 128—533 **11 Claims**



A corselet features an abdominal control unit positioned on the front wall thereof for the purpose of maintaining the abdomen flat and for holding up the top frontal edge of the garment. The control unit possesses the ability to perform these functions without restricting the ability of the wearer to twist, bend or stoop and without sacrifice of comfort and convenience. The invention is particularly characterized by economy of manufacturing and the use of a minimum amount of material. This renders the garment structure compact and flexible with a notable absence of bulkiness.

ERRATUM

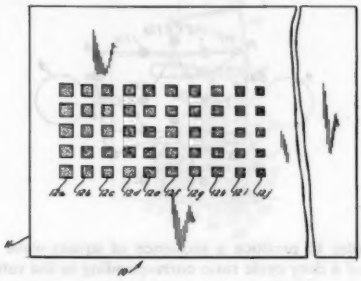
For Class 128—334 see:
Patent No. 3,722,599

3,722,515

CIGARETTE WITH MODIFIED PAPER WRAPPER

Martin Lance Reynolds, Anchorage, Ky.; James R. Hammersmith, Jeffersonville, Ind., and Harlie A. Parish, Jr., Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed March 13, 1972, Ser. No. 234,210
Int. Cl. A24d *1/02*
U.S. Cl. 131—15 B 3 Claims



An improved cigarette is prepared through use of modified cigarette paper as a wrapper. The wrapper is treated in preselected areas with a burn control additive comprising a mixture of potassium chlorate and sodium chlorate in a molar ratio of from 2.6:1 to 1.0:1. When the burning coal reaches the area of treatment, the treated area is burned away, allowing for the passage of air through the opening created during smoking of the cigarette. The mixture of potassium chlorate and sodium chlorate provides for a more stable treatment, particularly when the cigarettes having the thus treated wrapper are stored under conditions of high humidity.

3,722,516

SMOKING TOBACCO PRODUCT AND METHOD OF MAKING THE SAME

Koichiro Suwa, Minato-ku, Tokyo-to; Haruki Satoh, Nishi-ku, Yokohama-shi, and Atsuo Shida, Shinagowa-ku, Tokyo-to, all of Japan, assignors to Japan Monopoly Corporation and Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Feb. 9, 1971, Ser. No. 114,070
Int. Cl. A24b *03/12, 15/00*
U.S. Cl. 131—17 R 6 Claims

The addition of dihydroxyacetone to tobacco enhances its natural flavor characteristics. Additionally it modifies the tobacco odor so as to subdue irritating and disagreeable odor characteristics. Amino acids further enhance the effect. Effective amounts of the dihydroxyacetone and the amino acid are such that each is present in an amount of 0.01 to 1.0 percent by weight of the tobacco.

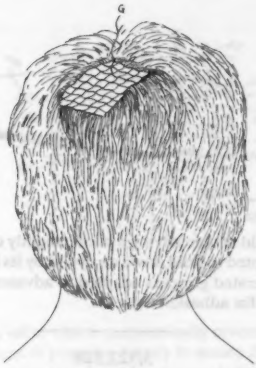
3,722,517

HAIR PIECES

Rene Molinario, Paris, France, assignor to S. A. Molinario, Paris, France

Filed June 11, 1971, Ser. No. 152,308
Int. Cl. A41g *5/00*
U.S. Cl. 132—5 12 Claims

A hair-piece having a base of resilient, flexible netting, the meshes of the netting having sides between 2 mm and 10 mm long to permit the user's scalp to breathe. Natural or artificial hairs are attached to the netting which is attached to the user's



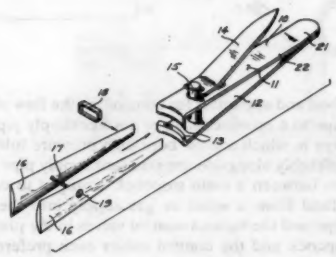
head by glueing individual living hairs to the edge of the netting.

3,722,518

FINGERNAIL CLIPPER CONTAINER

Frank E. Fravel, Springfield, Ohio, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed May 19, 1972, Ser. No. 254,917
Int. Cl. A45d *29/04*
U.S. Cl. 132—75.6 3 Claims



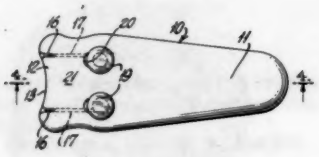
A fingernail clipper container which may be mounted on a conventional fingernail clipper so as to retain the cuttings and prevent their being scattered about during the clipping process. The container consists of two flat members which are mounted on each open side of a conventional open side fingernail clipper, with both side members being joined by an elastic or spring member that retains the side members in position without interfering with the normal movement of the clipping bars. A rectangular ring may be also employed to fasten the container sides to the clipper.

3,722,519

FALSE EYELASH APPLICATOR

Norman Epstein, R.D. No. 2, Carmel, N.Y.

Filed Aug. 21, 1968, Ser. No. 754,240
Int. Cl. A45d *40/26*
U.S. Cl. 132—88.7 3 Claims



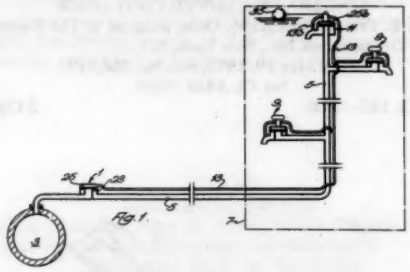
A hand-held device having a blunt, slightly concave blade at one end adapted to hold down an eyelid by its lashes and a pair of finger-operated grippers adapted to advance a false eyelash to the eyelid for adhesion thereto.

3,722,520

APPARATUS FOR AND METHOD OF CONTROLLING FLOW OF FLUIDS IN A PIPELINE

Eric Guy Brian Gledhill, Sutton, England, assignor to F. W. Talbot & Company Limited, Winchester, England

Filed Feb. 3, 1971, Ser. No. 112,271
Claims priority, application Great Britain, Feb. 10, 1970, 6411/70
Int. Cl. F17d *1/00*
U.S. Cl. 137—1 16 Claims



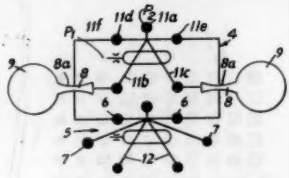
A method and apparatus for controlling the flow of fluid in a supply pipe to a premises such as a water supply pipe or a gas supply pipe in which a small bore high pressure tubing is provided preferably alongside the standard supply pipe and communicates between a main stopcock arranged to control the flow of fluid from a water or gas supply into the premises supply pipe and the various control valves in the premises, the main stopcock and the control valves each preferably being provided with an apertured diaphragm providing the only means of communication between the small bore tubing and the supply pipe whereby, when one of the control valves is opened, pressure is released in the small bore tubing to lift the diaphragm off the seat of the main stop cock to permit flow of fluid through the main stop cock into the supply pipe and vice versa. It is envisaged that instead of relying upon pressure signals to open and close the main stopcock electrical signals could be used. Clearly, by fitting such apparatus into a domestic water or gas supply, water or gas will only flow into the domestic system through the main stopcock when required thereby preventing wastage of water or gas in the event of a leak in the pipeline between the main stopcock and the premises.

3,722,521

FLUIDIC APPARATUS, MORE PARTICULARLY FOR THE DETERMINATION OF PRESSURE RATIOS

Guy Edward Davies, Fareham, and Christopher Guy Scott Wilson, Cowplain, both of England, assignors to Plessey Handel und Investments A.G., Zug, Switzerland

Filed June 1, 1971, Ser. No. 148,774
Claims priority, application Great Britain, June 2, 1970, 26,589/70
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 8 Claims



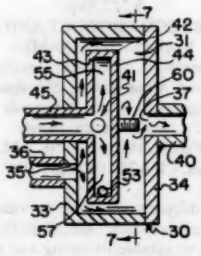
In order to produce a sequence of square-wave pressure pulses of a duty cycle ratio corresponding to the ratio of two input pressures, the lower one of the two input pressures and the pressure at the tapping of a Venturi, the outlet of which is also connected to the lower pressure, and to the inlet of which the higher one of the two pressures is applied via a fixed orifice, are applied to one pair of inputs of a double-input bistable fluidic switch whose other pair of inputs are connected to the output of a fluidic oscillator producing a triangle-waveform output and operated by the higher one of the input pressures.

3,722,522

VORTEX FLUID AMPLIFIER WITH NOISE SUPPRESSER

James E. Randall, Worthington, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Filed June 10, 1971, Ser. No. 151,698
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 6 Claims



A fluid vortex amplifier has a pin disposed in the position of the eye of a fluid vortex at the oulet of the vortex chamber so that the pin stabilizes the eye of the vortex and reduces the noise otherwise generated.

3,722,523

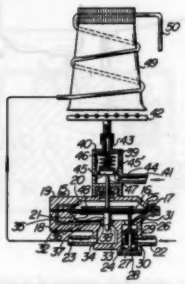
GAS WATER HEATER

Norio Kawabata, Kawanishi-shi; Masahiro Indo, Osaka, and Nobuhiko Nishibayashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 794,746, Jan. 28, 1969, abandoned. This application Oct. 14, 1970, Ser. No. 80,733
Int. Cl. F23n *1/00*
U.S. Cl. 137—94 3 Claims

This invention relates to a gas water heater wherein a diaphragm for opening a gas valve utilizing the water flow is

provided in the course of water supply passage to a heat exchanger, the low pressure chamber of said diaphragm is communicated with a low pressure Venturi portion formed by the aid of increasing the flow velocity in the water supply passage, and a control element is proceedably and recedably



provided in the Venturi portion to automatically regulate the aperture of the Venturi portion corresponding to the variation of amount of water flow, intended for automation of water amount control and promoting the enlargement of range of adjusting water temperature and simplification of operation.

3,722,524

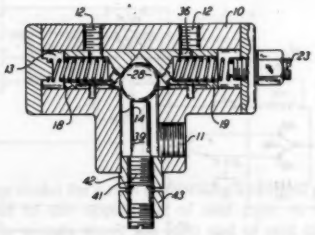
FLOW DIVIDER VALVE

Roger F. Engelmann, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed April 30, 1971, Ser. No. 138,923

Int. Cl. G05d *11/00*

U.S. Cl. 137—101 **8 Claims**



A valve body having an inlet opening and two outlet openings and an intermediate chamber. Two spools are slidably disposed in the chamber and have fluid passageways which move relative to the valve body outlet openings for varying the flow through the outlet openings. The spools are spring-biased and the spring pressure is adjustable. Also, a spool control member is disposed in the body for adjustably setting the limit position of the spools relative to their sliding movement for limitly setting the amount of flow through the valve.

3,722,525

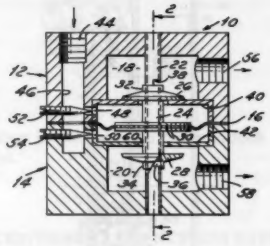
FLUID SWITCHING VALVE

Peter C. Epple, 20490 Balfour, Harper Woods, Mich.

Filed April 14, 1971, Ser. No. 133,845

Int. Cl. F16k *11/02*

U.S. Cl. 137—106 **6 Claims**



A flip-flop valve which automatically reverses in response to flow conditions or pressure supply to assure distribution selectively of pressure to selected outputs. A central control element subject to pressure in the system is supplemented by side elements which provide pressure area imbalance at selected times in the operation in response to dynamic flow conditions in the valve to cause reversal of direction to output ports.

3,722,526

PNEUMATIC TIMING MEANS

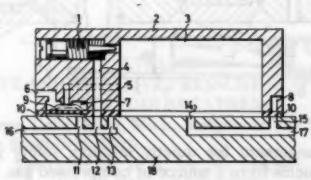
Karl Gosta Henningsson, Handen, Sweden, assignor to Atlas Copco Aktiebolag, Wacka, Sweden

Filed Sept. 11, 1970, Ser. No. 71,491

Claims priority, application Sweden, Sept. 19, 1969, 12937/69

Int. Cl. F16k *21/04*

U.S. Cl. 137—107 **15 Claims**

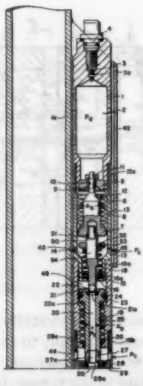


A pneumatic timing means, which is particularly suitable for use as a delay device or a pulse device at the output end of pneumatic control circuits, especially such pneumatic control circuits which are of the integrated fluidistor type. The pneumatic timing means has very few movable parts, which makes it very reliable, and its exhaust or draining path is very short and has very little flow resistance in the open condition, which makes the exhaustion or draining after each operation of the timing means very quick. The timing means includes first and second diaphragms, preferably integrally formed, for selectively opening and closing the exhaust channel and the output channel, respectively.

3,722,527
GAS LIFT VALVE APPARATUS

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed March 11, 1969, Ser. No. 806,070
Int. Cl. F04f 1/08
U.S. Cl. 137—155 6 Claims

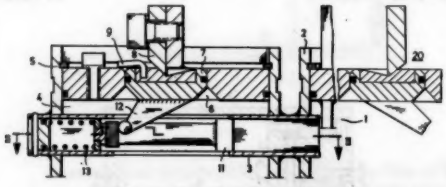


A gas lift valve used with well tubing, said valve employing a bellows means, pilot valve, and a power valve, the pilot valve being unconnected with the bellows means and differentially operated with a spring assist.

3,722,528
ARRANGEMENT FOR QUIETLY INFLATING SAFETY GAS BAGS IN MOTOR VEHICLES

Ernst Fiala, Braunschweig-Querum, Germany, assignor to Wolf-Dieter Klink, Danziger Weg, Germany

Filed Sept. 21, 1971, Ser. No. 182,490
Claims priority, application Germany, Sept. 21, 1970, P 20 46 515.0
Int. Cl. F16k 31/00
U.S. Cl. 137—255 4 Claims



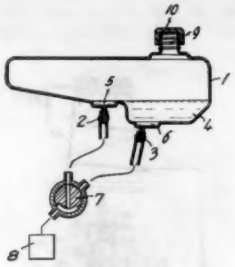
An arrangement for quietly inflating safety gas bags in motor vehicles from a source of compressed gas. The source has at least two pressure vessels separated from each other and each of the vessels has a discharge outlet. A valve is mounted at each of the discharge outlets for controlling the passage of gas therethrough respectively. A release mechanism is mounted at the vessels for opening the valve of one of the vessels after the valve of the other vessel opens.

3,722,529
VEHICLE FUEL TANK

Tsuneaki Arakawa, 14-24, 2-chome, Tokyo, Japan

Filed Aug. 3, 1970, Ser. No. 60,239
Claims priority, application Japan, Aug. 14, 1969, 44/76693
Int. Cl. F17c 3/00
U.S. Cl. 137—266 4 Claims

A fuel tank is provided which is blow molded for the simultaneous and integral formation of a hollow body including a multi-level bottom wall with pipes depending from different levels of the wall and being integrally formed therewith. Wells are provided which encircle the upper end portion of these

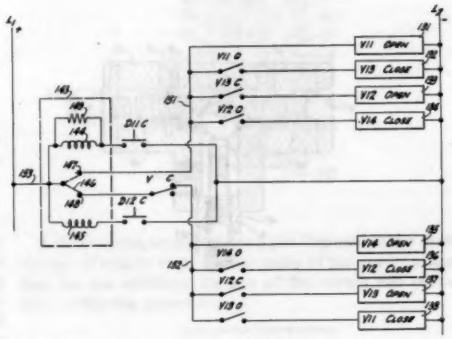


pipes. In addition, a charging pipe is provided at the top of the tank. A valve is connected to the pipes depending from the bottom wall for selectively using the same.

3,722,530
PIPELINE BY-PASS FLOW CONTROL SYSTEM

Lyle R. Van Arsdale, and Francis M. Lathrop, III, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.

Continuation-in-part of Ser. No. 719,338, April 8, 1968, abandoned, and a continuation-in-part of Ser. No. 796,619, Feb. 14, 1969, abandoned. This application Feb. 1, 1971, Ser. No. 111,351 The portion of the term of this patent subsequent to Nov. 16, 1988, has been disclaimed.
Int. Cl. B08b 9/04
U.S. Cl. 137—268 1 Claim

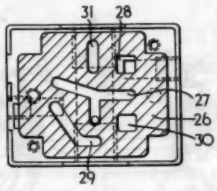


A system and method for ensuring continual movement of clean-out devices or product separating spheres past the pumping stations of pipelines. Valve controlled branch lines connect through flow-tees with the by-pass portion of the line. The valves of the branch lines are controlled by means including sphere detectors to provide an operating cycle for opening and closing the valves in such a fashion as to cause continual movement of clean-out devices or spheres through the by-pass line section.

3,722,531
ELECTRO MAGNETIC VALVE

Willem Jan Verhart, Molenstraat Prov. N-Holland, Netherlands, assignor to Martonair Limited, Twickenham, England

Filed Jan. 27, 1972, Ser. No. 221,355
Claims priority, application Netherlands, March 23, 1971, 7103843
Int. Cl. F16k *11/00*
U.S. Cl. 137—271 6 Claims

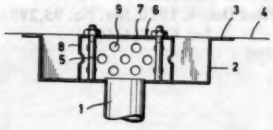


A valve including a housing defining a chamber having an outlet for delivering a pressurized fluid supply or transmitting a fluid pressure signal to an external position. The chamber is connected with two ports in a wall of the housing alternatively opened and closed electromagnetically. A plate abuts the housing wall and has an inlet and exhaust ports therein. A gasket is positioned between the plate and the housing wall and has apertures therein by which each of the ports in the housing wall is connected with one or other of the ports in the plate, the apertures in the gasket being so arranged that the connections between the ports in the housing wall and the plate respectively are interchangeable by inverting the gasket.

3,722,532
RAIN WATER DRAIN PIPE OR SIMILAR FOR A BUILDING

Olavi Ebeling, Temppelikatu 21, and Risto Lunden, Pakilantie 49, both of Helsinki, Finland

Filed Jan. 20, 1971, Ser. No. 108,049
Int. Cl. E04d *13/04*
U.S. Cl. 137—357 2 Claims



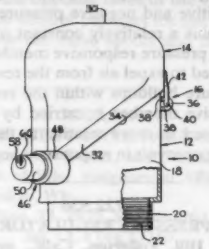
A rain-water outlet for a roof comprising a vertical pipe and a trough fixed to the upper end of said pipe. A cover is fastened in the trough above the inlet end of said pipe. The cover forms a closed surface larger than the inlet opening to cause water to flow radially in the trough to said inlet opening and to prevent axial section of air into the pipe.

3,722,533
PROTECTIVE CAP

Edward A. Connolly, Williamsville, N.Y., assignor to Fraser Sweatman, Inc., Lancaster, N.Y.

Filed Dec. 2, 1971, Ser. No. 204,193
Int. Cl. F16k *35/00*
U.S. Cl. 137—382 5 Claims

A protective cap for gas cylinder valves including a base and a cover pivotally mounted on the base forming an enclosure therewith. A concealed locking mechanism is provided on the cover and is key activated to insert a locking pin through

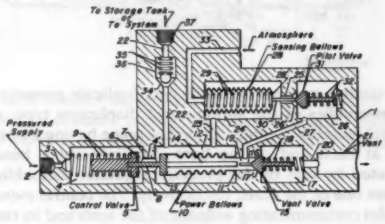


aligned openings in the base and cover to lock the latter in a closed position.

3,722,534
FLOW CONTROL VALVE SYSTEM WITH RAPID CLOSING VALVE

Theodore R. Breunich, Stamford, and August J. Hildenbrandt, Jr., Fairfield, both of Conn., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 12, 1971, Ser. No. 188,276
Int. Cl. F16k *31/12*, *17/02*
U.S. Cl. 137—488 9 Claims

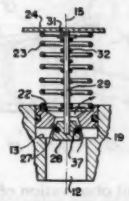


A flow control system providing for rapid closure of an inlet valve through the use of power control bellows or diaphragm means and auxiliary sensing bellows, pilot valve and vent valve means. The sensing bellows is precalibrated to move responsive to reaching a predetermined pressure level and then trigger a partial retraction of the control bellows and an opening of a vent valve which latter action effects a rapid closing of the main inlet valve.

3,722,535
POSITIVE AND NEGATIVE PRESSURE RESPONSIVE RESERVOIR BREATHER

Ray J. Raupp, Lake Orion, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 26, 1971, Ser. No. 146,941
Int. Cl. F16k *45/00*, *17/00*
U.S. Cl. 137—493.4 2 Claims



The invention is directed to a breather for the reservoir of a hydraulic system. Pressure surges occasioned by the flow of

large volumes of fluid into and out of the reservoir during the operation of the system are prevented. The breather is responsive to both positive and negative pressure changes, and accordingly maintains a relatively constant pressure within the reservoir. A first pressure responsive member is spring-biased and linearly moved to expel air from the reservoir in response to positive pressure buildups within the reservoir. A second pressure responsive member is carried by the first member and is spring-biased to move relative to the first member to admit air into the reservoir in response to negative pressures.

3,722,536

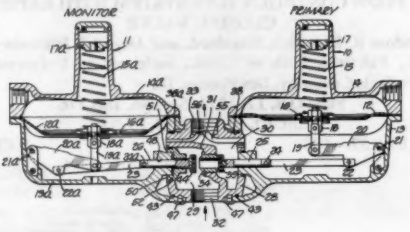
MONITOR PRESSURE REGULATOR ASSEMBLY

George Edward Hill, Fullerton, Calif., and Bruce Warren Tomlin, Glen Ellyn, Ill., assignors to The Singer Company, New York, N.Y.

Continuation of Ser. No. 61,916, Aug. 7, 1970, abandoned. This application Dec. 17, 1971, Ser. No. 209,172

Int. Cl. F16k *17/02*

U.S. Cl. 137—505.46 **1 Claim**



A central member connects two duplicate pressure regulator assemblies of the spring-urged diaphragm type, and this central member contains an orifice piece having a bore with a seat at each end of the bore. Separate valve heads each operated by one of the pressure regulator assemblies close against one of the seats, respectively. The central member has an inlet communicating with one of the seats and its respective valve head, and also has an outlet communicating with the other seat and its respective valve head. Pitot tubes establish communication between the outlet and pressure chambers on one side of each diaphragm. The regulator assembly operating the valve head on the downstream side of the orifice piece normally regulates gas pressure at the outlet, but, upon failure of that regulator assembly, the other regulator assembly automatically takes over control.

3,722,537

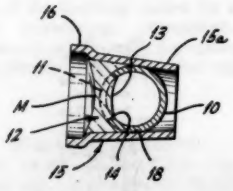
SIGHT GLASS

David A. Gregerson, Richmond, and Gerald J. Selm, Connersville, both of Ind., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed April 8, 1971, Ser. No. 132,313

Int. Cl. G01f *23/02*

U.S. Cl. 137—559 **5 Claims**



A sight glass to permit observation of refrigerant flowing in a refrigeration system. The glass is installed directly in the refrigerant flow line, rather than in a coupling or component connected into the line.

3,722,538

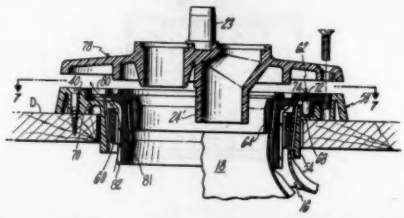
BLIND CAVITY HOLDING SUMP

Walter A. Gezari, Killingworth, Conn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 24,789, April 1, 1970. This application March 10, 1971, Ser. No. 122,721

Int. Cl. A47j *41/00*; B65d *25/18*

U.S. Cl. 137—588 **14 Claims**



A sanitary holding sump which can be formed in a blind cavity such as a toilet sump below an interior deck of a boat. The sump is formed with a laminated construction including two plastic bags, one within the other, and an intermediate plastic foam filler which has been cured to a rigid state. The top of the sump is sealed to the bulkhead and includes a ducted two-part cover plate for receiving and discharging waste material. The sump is formed below an interior deck by installing a first plastic bag connected to a first flange through an aperture in the interior deck, then placing a charge of foaming plastic resin in a substantially liquid state in the first bag, and then installing a second plastic bag connected to a second flange which covers the first flange. The inner bag is then pressurized internally, displacing the foaming resin in the outer bag and distributing it substantially evenly throughout the entire cavity or space between the two bags. Some expansion of the outer bag is accomplished by means of the foaming action of the resin. The resin eventually sets in its foamed state to provide the structural rigidity of the sump.

3,722,539

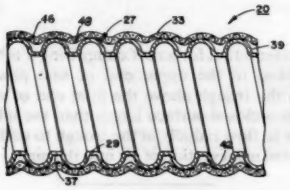
FLUID FEED CONDUIT FOR PROCESSING APPARATUS

Henry Schmidt, Jr., Hinsdale, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Dec. 4, 1970, Ser. No. 95,297

Int. Cl. F16l *9/06*

U.S. Cl. 137—590 **8 Claims**

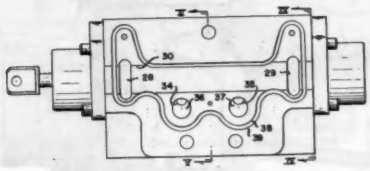


A fluid distributing and collecting conduit for transferring liquid under pressure to and from materials confined within a processing vessel comprises a thin walled, helically convoluted rigid tube having a plurality of spatially disposed orifices located in the bottom of the external helical groove. A fine mesh sleeve is tightly fitted over the tube to prevent said material from entering said tube.

3,722,540
SECTIONAL CONTROL VALVES

Joseph N. Mazur, Poland; Edward J. Ratkay, Canfield, and Robert F. Hodgson, Mahoning, all of Ohio, assignors to Commercial Shearing & Stamping Company, Youngstown, Ohio

Filed May 20, 1971, Ser. No. 145,219
Int. Cl. F16k 11/00
U.S. Cl. 137—596 5 Claims

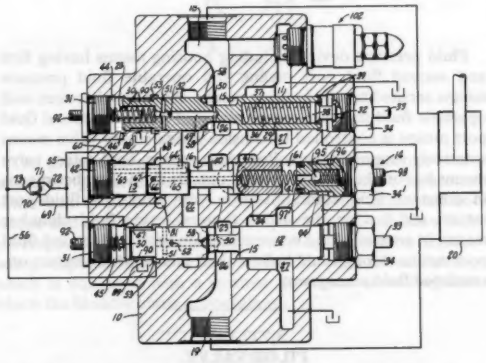


A sectional control valve is provided made up of a plurality of control sections between an inlet manifold and an outlet manifold, the sections having interconnecting high pressure passages and low pressure passages which connect with one another at the junction of the sections, each control section having service passages means for connecting a fluid motor and a movable valve element to control communication of its service passage means with its high and low pressure passages, said sections having substantially flat mating surfaces at their junctions, a relief groove extending lengthwise of this section through at least one of said flat mating surfaces parallel to the movable element and intersecting the low pressure passages, said high pressure passages intersecting the flat mating surfaces spaced from said relief groove and continuous low pressure seal means surrounding the low and high pressure passages and intersecting the relief groove adjacent its ends.

3,722,541
CONTROL VALVE

Raud A. Wilke, Brookfield, Wis., assignor to Koehring Company, Milwaukee, Wis.

Filed Dec. 8, 1971, Ser. No. 206,026
Int. Cl. F16k 11/07, 11/10
U.S. Cl. 137—596 22 Claims

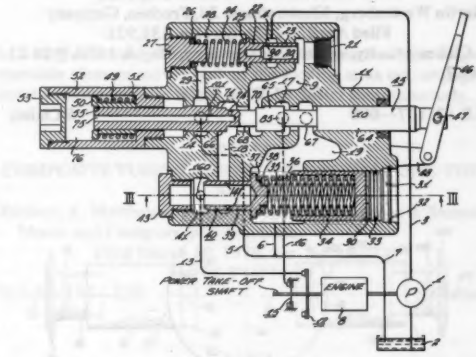


A sectional control valve having a pressure compensating valve to control fluid flow to each of a pair of service passages which provide for connection of the valve with the opposite sides of a reversible fluid motor. A separate valve spool for each service passage is movable to feed and vent positions to communicate its service passage with either pressure fluid supply or return passage means. Each valve spool is automatically actuated to its vent position by a hydraulic actuator that is energized by pressure fluid flowing to the service passage governed by the other valve spool, in the feed position of the latter. Grooves in the opposite faces of the valve section provide portions of the control passages for the hydraulic actuators associated with the valve spools and the compensating valve plunger.

3,722,542
PRESSURE BIASED POWER TAKE-OFF VALVE

Ralph W. Matthews, New Berlin, and Nicholas W. Semeniak, Milwaukee, both of Wis., assignors to Allis Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 23, 1971, Ser. No. 201,292
Int. Cl. F16k 11/10
U.S. Cl. 137—596.1 10 Claims

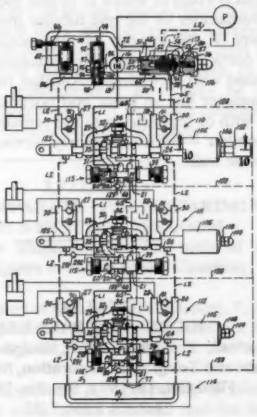


A pressure control valve for a power take-off clutch and brake which is pressure biased to a clutch operating position when the valve is initially positioned in the clutch operating position.

3,722,543
PRESSURE COMPENSATED CONTROL VALVE

Francis H. Tennis, Oconomowoc, Wis., assignor to Hydraulic Industries, Inc., Gartland, Wis.

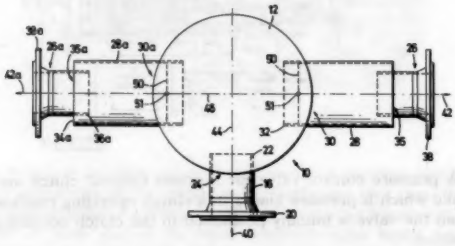
Filed Nov. 2, 1971, Ser. No. 194,825
Int. Cl. F16k 11/10, 11/07
U.S. Cl. 137—596.12 50 Claims



Each spool of a control valve has its own pressure compensated flow controlling mechanism, and a single unloading valve serves to divert the pump output to tank when all of the valve spools are in neutral positions. In a control valve of sec-

tional construction, pressure signals necessary for operation of the flow controlling mechanism and/or the unloading valve are obtained through pilot passageways having portions formed as grooves in the surfaces of the sections at their junctions. The flow controlling mechanisms can be provided with pressure responsive valve plungers which adapt their respective spool sections for parallel operation, or for series-parallel operation, or even a mixture of both; and with a minimum of modification, series operation is also made possible.

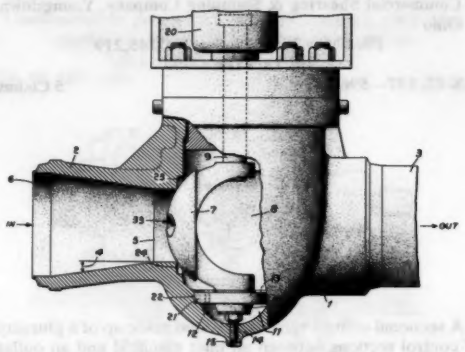
3,722,544
PNEUMATIC CONVEYING SYSTEM
Martin Westenberg, Klosterstrasse 34, Frechen, Germany
Filed April 7, 1971, Ser. No. 131,921
Claims priority, application Germany, May 5, 1970, P 20 21 847.7
Int. Cl. F16k *21/00*
U.S. Cl. 137—608 **6 Claims**



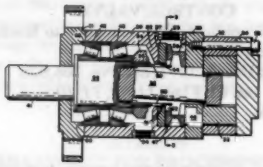
A pneumatic conveying system has a receptacle provided with at least two apertures having inclined axes. A first tubular element is seal-tightly mounted in one of the apertures and a portion — which may be of one piece with or separate from the remainder of said first tubular element — surrounds the aperture in the interior of the receptacle. A second tubular element is also seal-tightly mounted in the other of these apertures. It includes one tubular member of a larger diameter and an inner end portion of which — of one piece with or separate from the remainder of the one tubular member — surrounds the aperture in the interior of the receptacle, whereas the outer end portion of this one tubular member has a transverse wall provided with an opening. Another tubular member of a smaller diameter has an inner end portion — again either of one piece with or separate from the remainder from the other tubular member — which interiorly surrounds the opening in the transverse wall.

3,722,545
MODULATING BALL VALVE
Romeo Furlani, Providence, R.I., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Oct. 18, 1971, Ser. No. 189,857
Int. Cl. F16k *3/32*
U.S. Cl. 137—625.3 **10 Claims**

A modulating ball valve wherein a rotatable plug supported by trunions journalled along an axis transverse to the direction of flow of the fluid to be controlled is provided with an indentation on the surface thereof. The indentation is formed as a plurality of overlapping cones having different base diameters, and it provides, in combination with a circular arc cutout in said plug and a tapered inlet aperture in the casing of said valve, a desired fluid flow characteristic.



3,722,546
FLUID PRESSURE DEVICE HAVING OUTSIDE-INSIDE ROTARY VALVE MEANS
George V. Woodling, 22077 W. Lake Road, Rocky Riber, Ohio
Filed July 27, 1971, Ser. No. 166,547
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.21 **7 Claims**

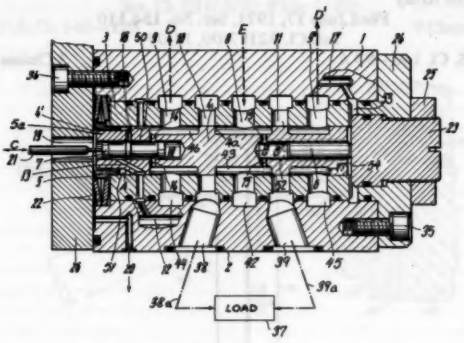


Fluid pressure device including housing means having first and second fluid port means and operable fluid pressure means secured to said housing means. Fluid flow between said operable fluid pressure means and said first and second fluid port means is controlled by outside-inside rotary valve means rotatively supported by hollow shaft means. Said rotary valve means has on the outside thereof outside fluid chamber means in constant fluid communication with said first fluid port means and has on the inside thereof inside fluid chamber means in constant fluid communication with said second fluid port means through said hollow shaft means which has an unrestricted fluid passageway.

3,722,547
PILOT VALVE
Lothar Kirstein, Bad Kreuznach, Germany, assignor to Jos. Schneider & Co. Optische Werke, Bad Kreuznach, Germany
Filed Oct. 18, 1971, Ser. No. 190,219
Claims priority, application Germany, Oct. 21, 1970, P 20 51 582.6
Int. Cl. F16k *11/00*
U.S. Cl. 137—625.23 **10 Claims**

The working piston of a pilot valve has an extremity formed with an axial bore which receives a pilot piston with two or three heads defining one or two peripheral recesses included

in a throttled path for the controlled admission of high-pressure fluid to a peripheral shoulder on that extremity. An oblique passage, forming part of that fluid path, extends in the region of the peripheral shoulder within the body of the work-



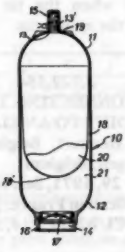
ing piston. The selected position of the working piston is maintained by countervailing fluid pressure acting upon a land of this piston, the effective area of that land being half that of the peripheral shoulder which in a state of balance is subjected to half the countervailing fluid pressure.

3,722,548

PRESSURE VESSEL

Jacques H. Mercier, 49 rue de Naples, Paris, France

Filed Oct. 13, 1971, Ser. No. 188,971
Claims priority, application France, Oct. 30, 1970, 7039179
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **17 Claims**



The present invention relates to a pressure reservoir comprising a rigid envelope having two ports, a flexible separator in the form of a bladder disposed in the interior of the said envelope and dividing it into two compartments for fluids which are respectively in communication with said ports, the bladder being adapted to move to the vicinity of one of the said ports, which is equipped with a strainer device or screen against which the bladder abuts in operation.

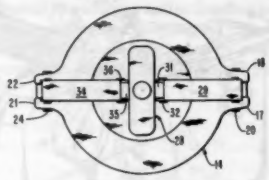
3,722,549

CAP AND LOCKING MEANS THEREFOR

Fred A. Wilson, Florence, Ky., and Lindol H. Sprague, Deer Park, Ohio, assignors to Dover Corporation, Cincinnati, Ohio

Continuation of Ser. No. 821,290, May 2, 1969, abandoned. This application March 19, 1971, Ser. No. 126,365
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **9 Claims**

A cap for closing the end of a pipe has a pair of locking arms pivotally mounted thereon for cooperation with an inclined surface of an adapter that is connected to the end of the pipe. Each of the locking arms is pivotally connected through a link



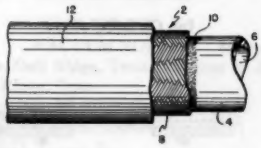
to a single movable element whereby movement of the single movable element moves both of the locking arms into engagement with the inclined surface of the adapter simultaneously.

3,722,550

COMPOSITE TUBING AND METHOD FOR MAKING THE SAME

Richard A. Matthews, Chagrin Falls, Ohio, assignor to Samuel Moore and Company, Mantua, Ohio

Filed March 10, 1970, Ser. No. 18,272
Int. Cl. F16l *11/04*
U.S. Cl. 138—137 **5 Claims**



A composite tubing product and method for making the same, the tubing includes an elastomeric polyurethane inner core tube having a peripheral zone of elastomeric, adhesively activated core tube material on the outer surface of the tube, a stranded reinforcement layer elastomerically secured to the core tube by the adhesively activated material, and an outer sheath disposed around the reinforcement layer. In another form, an additional reinforcement layer may be disposed around the first reinforcement layer, and such additional layer is generally free of securement to the first layer.

3,722,551

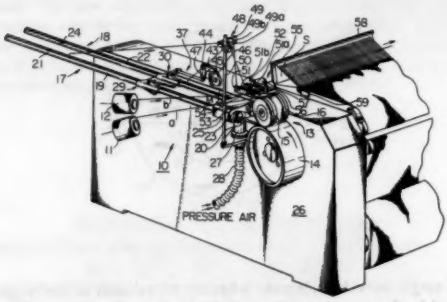
METHOD AND APPARATUS FOR PREPARING WEFT YARN IN A SHUTTLELESS LOOM

Yokio Mizuno, and Shigenori Tanaka, both of Kodaira, Tokyo, Japan, assignors to Nisson Motor Company, Limited, Yokohama, Japan

Continuation-in-part of Ser. No. 848,253, Aug. 7, 1969, abandoned. This application May 10, 1971, Ser. No. 141,682
Int. Cl. D03d *47/34*
U.S. Cl. 139—127 P **11 Claims**

A method and apparatus for preparing a plurality of separate weft yarns each to be inserted into its individual separate sheds of arrayed warp yarns in a shuttleless loom. The method is carried out by inserting a plurality of different weft yarns, each in two consecutive steps, into the individual separate sheds of warp yarns whereby different or differently colored weft yarns may be picked. The apparatus includes a

plurality of storage means for storing loops of weft yarns to be inserted into the shed of warp yarns, and a plurality of engaging means associated with the plurality of storage means for



engaging the loops of the weft yarns at timed intervals to cause each of the weft yarns to be successively picked into the sheds of the warp yarns in two consecutive insertions.

3,722,552

HYDRAULIC WEFT INSERTER DRIVE IN WEAVING MACHINES

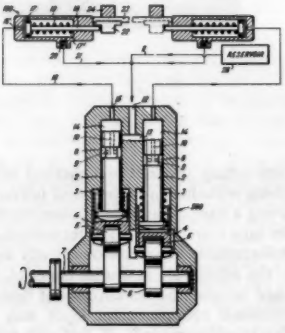
Jaromir Indra, and Vaclav Opatril, both of Brno, Czechoslovakia, assignors to Elitex, Zavody Textilniho Strojirenstvi Generalni Reditelslvi, Liberec, Czechoslovakia

Filed July 14, 1971, Ser. No. 162,344

Claims priority, application Czechoslovakia, July 17, 1970, 5039/70

Int. Cl. D03d *49/34*

U.S. Cl. 139—144 **11 Claims**



The present invention relates to hydraulic weft inserter drives for weaving looms.

Each of a pair of hydraulic units is located at opposite ends of a guideway along which the weft inserter is slidably movable. Each hydraulic unit contains a piston whose shaft is extendable in a direction along the guideway in a direction along the guideway on the application of hydraulic pressure on the piston in its normally retracted state. A double pump is operated in synchronism with the loom, each half of the pump being connected to a corresponding hydraulic unit, in such a way that hydraulic pressure is alternately applied to each of the hydraulic units by out of phase operation of each of the pump halves. Biased to retract inside the hydraulic units, the driving pistons of the corresponding hydraulic units are alternately extended, each driving piston being extended in an opposite direction along the guideway, to contact the weft inserter and urge it to move towards the other end of the guideway.

3,722,553

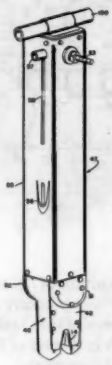
WIRE TYING APPARATUS INCLUDING TIMING AND STOPPING MECHANISM

Benjamin M. Bartilson, Columbus, Ohio, assignor to The United States of America as represented by the Secretary of the Army

Filed June 17, 1971, Ser. No. 154,110

Int. Cl. B21f *7/00, 15/04*

U.S. Cl. 140—93 A **3 Claims**



An improved apparatus for tying a relatively stiff tie wire around a cluster of wires or cables by means of counterrotating discs having wide slots which enable the discs to be placed down around the cluster of wires to be tied. The apparatus has a timing mechanism for providing a predetermined number of revolutions of the wrapping discs and a stopping mechanism for stopping the discs at a specified point to insure that the slots will be aligned when the tie is completed thereby facilitating removal of the apparatus.

3,722,554

APPARATUS FOR CONNECTING THE FREE ENDS OF A TWISTED WIRE JOINT TO AN ELONGATE MEMBER

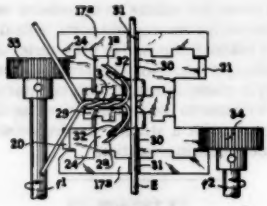
Willy Vanderfaeillie, Heestert, Belgium, assignor to N. V. Bekaert S.A., Zwevegen, Belgium

Filed July 29, 1971, Ser. No. 167,249

Claims priority, application France, July 31, 1970, 7028373

Int. Cl. B21f *27/14, 33/02*

U.S. Cl. 140—115 **4 Claims**



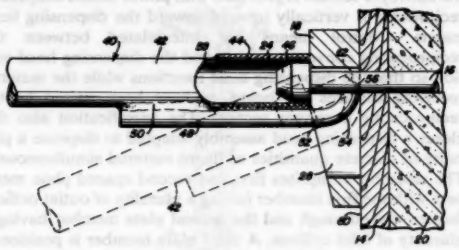
A method and apparatus for the connection of free ends of wire extending from a twisted wire joint to an elongate member are disclosed wherein the free ends are first bent back in opposite directions and on opposite sides of the twisted wire joint and thereafter the bent free ends of the wire, but not the twisted joint, are wound in opposite directions around the elongate member.

3,722,555

BREAKER FOR PLASTIC FORM TIES

Delwin F. Voelsch, Watertown, S. Dak., assignor to Schull Construction Co., Watertown, S. Dak.

Filed Jan. 6, 1972, Ser. No. 215,793
Int. Cl. B21f 9/00; F16g 11/00
U.S. Cl. 140—123 **7 Claims**



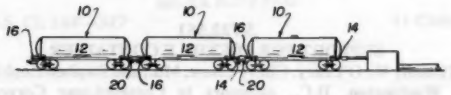
An elongated lever defining an endwise outwardly opening tie rod head receiving recess at one end and having an extension projecting endwise outwardly from one side of that one lever end terminating outwardly in a laterally inwardly directed end portion spaced outwardly of the recess and terminating radially outwardly of the center axis of said recess.

3,722,556

ROLLING PIPE LINE ASSEMBLY, SYSTEM AND METHOD

William Jeffers, 6235 W. 8th Place, Oak Lawn, Ill., and James Michael Jeffers, 105 Twin Oaks Drive, Joliet, Ill.

Filed Aug. 19, 1971, Ser. No. 176,765
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—2 **16 Claims**



A rolling pipe line system and method is disclosed comprising a plurality of wheeled tank cars, each of the tank cars being provided with one pipe extending outwardly from adjacent one end and another pipe extending outwardly from adjacent the other end thereof, and connector means for interconnecting adjacent pipes extending outwardly from adjoining tank cars thereby to establish fluid communication as between adjoining tank cars throughout the complete series of such tank cars. The system and method permits the loading, transporting and unloading of a fluid from the interconnected tank cars without the necessity of loading and unloading each of the tank cars individually.

3,722,557

APPARATUS FOR ADDING MEDICAMENTS TO A SEALED EXPANDABLE PARENTERAL FLUID CONTAINER

James A. Huggins, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed March 3, 1971, Ser. No. 120,412
Int. Cl. B65b 31/04, 31/03
U.S. Cl. 141—59 **18 Claims**

A rigid chamber formed by a pair of hinged members which are shaped to receive an expandable container such as a plastic bag of parenteral fluid contains a first opening which is selectively connected to a source of vacuum and a second opening through which a sealed tubular port on the container may be placed so that it will be accessible from the exterior of the chamber to permit the connection thereto of a vial containing a material such as a medicament to be added to the bag. The chamber is pivotally mounted for movement between a horizontal bag loading and unloading position and a vertical position for adding medicaments. The vacuum supply to the chamber is automatically controled by a valve built into the pivotal mounting so that in the horizontal position of the

chamber the vacuum is shut off and in the vertical position it is actuated. The arrangement makes it possible to add the contents of vials containing not only freely flowing liquid additives but also very viscous ones as well as powdered or granular materials. The system can also be operated is such a way that the contents of a plurality of medicament vials or syringes can be added to the bag even though the volume of the material to be transfered from the plurality of medicament containers is greater than the initial free air volume in the bag.

3,722,558

VACUUM NOZZLE

Paul W. Worline, Oak Ridge, Tenn., assignor to Acraloc Corporation, Oak Ridge, Tenn.

Filed Dec. 10, 1970, Ser. No. 96,940
Int. Cl. B65b 31/04; F16k 23/00
U.S. Cl. 141—65 **8 Claims**

A nozzle affixable to the line from a vacuum source and adapted for use in evacuating thin film packages containing food products such as meats, cheeses, and the like. The nozzle comprises an elongated cylindrical tube terminating at one end in means for connecting it to a vacuum line, and terminating at the other end in a hollow valve element. The tube is mounted in a housing, which terminates at its forward end in a nozzle tip. A portion of the inside surface of the nozzle tip is configured to serve as a seat for the hollow valve element. The nozzle tip has at least one perforation, one end of which forms an opening in the exterior surface of the nozzle tip and the

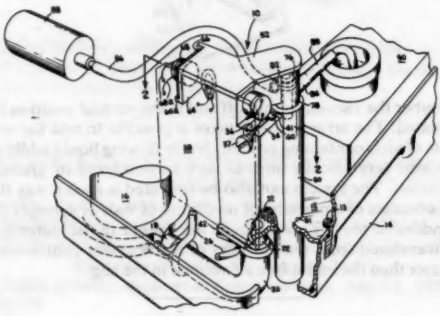
other end of which forms an opening in the interior surface of the nozzle tip rearwardly of said seat. The tube is shiftable, with respect to the housing, between an open position wherein the hollow valve element is spaced from the seat portion of the nozzle tip and a closed position wherein the hollow valve element abuts the seat portion of the nozzle tip. Means are provided to bias the tube to its closed position.

3,722,559

OPTICAL MONITORING CHAMBER UNIT FOR TONER DENSITY CONTROLS

Lionel B. Hoffman, Wyckoff, N.J., assignor to Pitney Bowes-Sage, Inc., Hawthorne, N.J.

Filed April 7, 1971, Ser. No. 131,950
Int. Cl. B65b *3/04*
U.S. Cl. 141—98 **4 Claims**



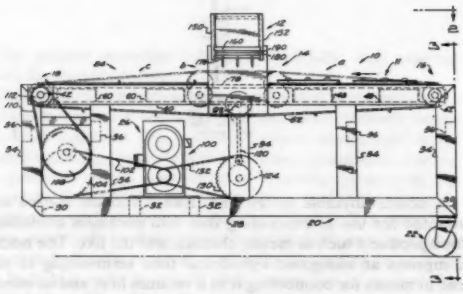
A unit included in a toner density control (TDC) for electrostatic photocopiers incorporates an optical monitoring chamber, a filter chamber, and a venturi suction chamber for selectively introducing toner replenisher to a developer liquid pumped therethrough. A circuit board is detachably clamped to the unit and mounts a lamp and a pair of photocells in operative positions relative to the monitoring chamber.

3,722,560

DISPENSING HEAD AND CONVEYOR

Richard L. Morine, Mentor, and James J. Hokes, Lakewood, both of Ohio, assignors to Fedco, Inc., Mentor, Ohio

Filed March 29, 1971, Ser. No. 128,805
Int. Cl. B65b *43/52*
U.S. Cl. 141—172 **9 Claims**



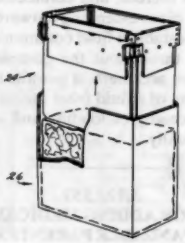
A dispensing apparatus and conveyor particularly suitable for use in bakeries for depositing fillings and the like into or on bakery products, or for supplying batter to pans. The apparatus broadly includes a combined dispensing head means and conveyor means which are actuated in timed relationship. The dispensing head means is located at a first position and arranged for discharging predetermined quantities of fluent material in a downward direction. The conveyor means passes beneath the dispensing head means and functions to move material receiving surfaces or products past the head means. At least one section of the conveyor extends generally horizontally under the depositing head means. Additionally, the conveyor section is provided with power means adapted to reciprocate it vertically upward toward the dispensing head means. Control means are interrelated between the reciprocating conveyor section and the dispensing head section so that the dispensing head functions while the material receiving surfaces are being, or have been, raised by the reciprocating conveyor section. The specification also discloses a dispensing head assembly adapted to dispense a plurality of discrete quantities of fluent material simultaneously. The assembly comprises first and second spaced plate members with the first member having a plurality of outlet orifices formed therethrough and the second plate member having a plurality of inlet orifices. A third plate member is positioned between the first and second plates for reciprocation relative thereto. The third plate member also has a plurality of openings formed through it and these openings define a plurality of closed, movable chambers. Positioned in each of the chambers is a piston or pusher member which divides the chambers into first and second chamber portions. The piston members and the third plate member are connected with actuating means adapted to simultaneously move all of the first and second chamber portions to alternately connect them with selected inlet and outlet orifices. Further, second actuating means are provided for reciprocating the third plate member independently of the first actuating means and the pusher members so that the third plate can be moved intermediate the movements produced by the first actuating means.

3,722,561

SUPPORT FOR FLEXIBLE CONTAINER

Timothy W. O'Leary, Chevy Chase, Md., and Stephen Hopkins, Washington, D.C., assignors to Compackager Corporation, Washington, D.C.

Filed June 30, 1971, Ser. No. 158,210
Int. Cl. B65b *39/00*
U.S. Cl. 141—316 **7 Claims**



A support sleeve for a flexible bag-like container is provided having a rigid collar portion and a plurality of independently flexible wall portions depending from the collar portion; the support frame is adapted to be inserted into the flexible container to maintain the mouth and body of the container open so that material may be deposited therein and compacted in a material compressing unit.

3,722,562
METHOD AND DEVICE FOR STRAIGHTENING BEAMS

Charles D. Stegmuller, Moosa Canyon Road, Bonsall, Calif.

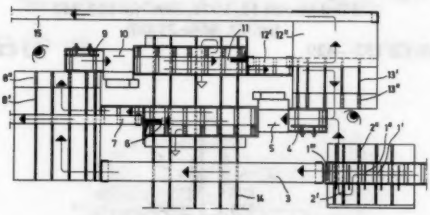
Filed April 9, 1971, Ser. No. 132,691
Int. Cl. B27
U.S. Cl. 144—309 3 Claims

This invention relates to a method and device for straightening twisted wooden beams and the like and involves the use of clamping and twisting devices to straighten said beam together with a wrapped tensioning guy attached adjacent to each end of the straightened beam to hold the same in a tense position.

3,722,563
METHOD OF MASS-PRODUCING SKIS AND AN APPARATUS THEREFOR

Engelbert Schober, Bannholzstrasse 302, Vaduz Liechtenstein, Austria

Filed April 6, 1971, Ser. No. 131,696
Int. Cl. B27d *3/00*
U.S. Cl. 144—317 11 Claims

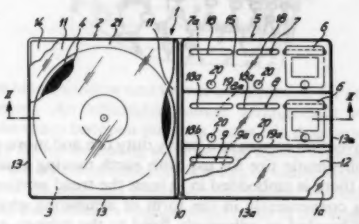


The instant invention relates to an improved automated method of mass-production of skis which are mainly wooden in construction and an apparatus therefor. The method uses planks of wood cut from timber in such a way that the longitudinal surface of the planks is substantially parallel to the course of the wood grains thereby utilizing to the best advantage the inherent fibrous property of wood. The method further comprises combining and dividing said planks into blocks and subsequently sheets of required sizes for the construction of skis. Sheets so procured are next preheated and an adhesive applied thereto to form sheet packs; the sheet packs are transferred to a press machine wherein as the packs travel they are continuously subjected to a high pressure, at the same time applying further heat where necessary. The sheet packages emerging are transferred next to a machine where the required operations such as planing, selective edge trimming by milling, and grinding are performed by a group of tools to produce raw-skis; the raw-skis are then painted, screen printed and varnished in an automatic machine wherein there may be infrared-ray drying. The preliminary drying and further drying of planks and sheet packs respectively are preferably by means of electrical resistance heating. The process provides a very fast, efficient, automatic and economical method of mass-production of skis.

3,722,564
TRAVEL CASE

Alexander Croon, Hans-Carossa-Strasse 5, Stockdorf near Munich, Germany

Filed March 6, 1970, Ser. No. 17,057
Claims priority, application Germany, Dec. 18, 1969, G 69 48 981.2; March 10, 1969, G 69 09 483
Int. Cl. A45c *11/18*
U.S. Cl. 150—39 6 Claims

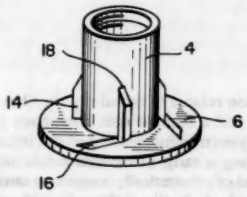


A travel case for a phonograph record and photographic transparencies in which a generally rectangular, transparent sheet defining first and second portions provided by a transverse fold therebetween, with the first portion including a first juxtaposed cover joined thereto along three edges of the sheet to provide a pocket for receiving a record and the second portion a juxtaposed cover means joined to the sheet along three edges thereof and along one line at right angles to the transverse fold to define at least two vertically spaced horizontal rows of compartments, and each of the compartments being open adjacent its top and adapted to receive therein a photograph transparency.

3,722,565
BARBED T-NUT

Robert E. Miller, Jr., Bronxville, N.Y., and Anthony J. Balchunas, Rahway, N.J., assignors to Robert E. Miller & Co., Inc., New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,115
Int. Cl. F16b *39/00*
U.S. Cl. 151—41.73 2 Claims

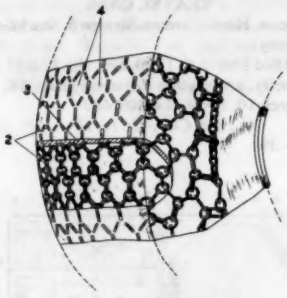


A T-nut for driven insertion into a preformed axial bore in the bottom of a wooden furniture leg or the like comprises a flange extending radially outward from the lower end of an internally threaded barrel. The flange has, struck out from wholly within its perimeter, a series of equidistantly spaced barbs which are upstanding in contact with the barrel surface and become embedded in the surrounding wood when the barrel is driven up into the bore.

3,722,566
TIRES

Hans Otto Dohmeier, Transvaal Province, Republic of South Africa, assignor to Dome Inventions (Proprietary) Limited

Filed March 1, 1971, Ser. No. 119,541
Claims priority, application Republic of South Africa, March 2, 1970, 70/1340
Int. Cl. B60c 7/22
U.S. Cl. 152—169 13 Claims

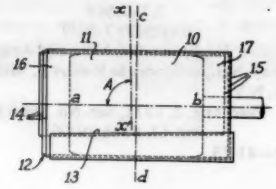


The invention relates to a heavy duty tire and more particularly a pneumatic tire for use with earth moving equipment, wherein there is embedded in at least the tread portion metal elements conveniently in the form of armouring chain, said elements bonded or adhesively fixed to the rubber, ensuring simultaneous wear of both rubber and reinforcing elements.

3,722,567
RADIAL-PLY PNEUMATIC TIRE

Emile Jean Delobelle, (92) Colombes, France, assignor to Pneumatiques Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France

Division of Ser. No. 702,031, Jan. 31, 1968, abandoned. This application Dec. 15, 1970, Ser. No. 98,360
Int. Cl. B60c 9/02
U.S. Cl. 152—354 3 Claims

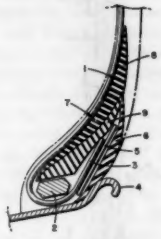


This invention relates to radial-ply tires having a reinforced breaker layer and a carcass that comprises a plurality of superimposed layers of cord fabric and the invention consists in helically winding a strip of carcass fabric of constant width and constituted of substantially transverse cords, on a cylindrical drum, thereby helically shifting the side edges of the strip and thus obtaining in the beads of the finished tire a staggering of the edges of the layers of carcass. In one embodiment, a first strip of carcass fabric of constant width is helically wound and the side parts of said strip are folded from the inside to the outside around the bead wires, whereafter a second helically wound strip of the fabric is superimposed on the first strip but the side parts of the second strip are folded from the outside to the inside around the bead wires. The edges are preferably helically displaced.

3,722,568
LOWER SIDEWALL REINFORCEMENT FOR A RADIAL TIRE

Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.P.A., Milan, Italy

Filed Oct. 26, 1971, Ser. No. 192,152
Claims priority, application Italy, Oct. 28, 1970, 89568 A/70
Int. Cl. B60c 15/06
U.S. Cl. 152—374 9 Claims

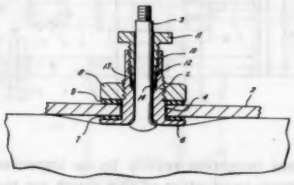


An improved radial tire is disclosed which contains a rubber filling over the bead core wherein the rubber filling consists of two structural shapes being adjacent to one another. One shape is formed from a low hardness compound while the other is made from a high hardness compound with the latter shape being directed towards the axially outer zone of the bead. A sheet of a hard compound is placed in the axially outermost position of the bead adjacent to a strip of metal cord fabric which in turn is placed next to the high hardness structural shape. This structure prevents the metallic cord fabric from detaching itself from the tire which occurs when conventional radial tires are subjected to normal service conditions. It also prevents separation between the rubber filling and the carcass plies when the tires are subjected to severe service conditions.

3,722,569
INNER TUBE SEALING MEANS

George W. Hughes, 3405 Ennis, Houston, Tex.

Filed March 11, 1971, Ser. No. 123,247
Int. Cl. B60c 29/00
U.S. Cl. 152—429 3 Claims



A means for sealing the air within a tire casing and locking the valve stem in position on the rim so that air escaping from the inner tube will not leak from the casing.

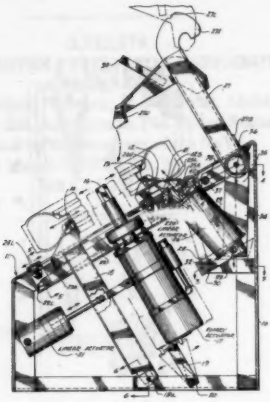
3,722,570
TIRE CHANGER

John D. McKenney, South Laguna, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed March 10, 1971, Ser. No. 122,983
Int. Cl. B60c 25/06
U.S. Cl. 157—1.28 7 Claims

A tire changer having fixed bead breakers arranged to be operative on opposite faces of the same half of a wheel to ef-

fect the squeezing action for bead breaking in the fashion of ice tongs. One of the bead breakers is automatically actuated and the other bead breaker is adapted to be manually positioned adjacent the wheel rim and the tire to slide therebetween in response to the movement of the automatically actuated bead breaker. Chucking means is provided for automatically positioning and holding inflated tires of varying



sizes on the tire changer in proper relationship with the bead breakers without resorting to any manual adjustments to accommodate tires of different sizes. The chucking means includes a movable wheel chuck adapted to be positioned in unison with the conventional rotary motor to position the rotor shaft in the center of the wheel. The rotary motor accommodates a tire tool for effecting the disengagement of the tire around the complete outer periphery of the wheel.

3,722,571

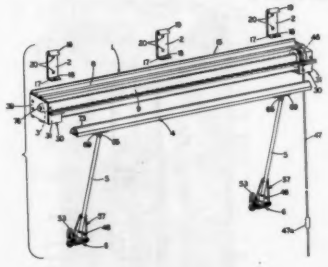
SELF-STORING AWNING

John D. Knight, Mantua, and Andrew J. Darula, Lakewood, both of Ohio, assignors to The Astrufs Company, Cleveland, Ohio

Continuation of Ser. No. 803,714, March 3, 1969, abandoned. This application Sept. 21, 1970, Ser. No. 73,851

Int. Cl. E04f *10/06*

U.S. Cl. 160—68 **5 Claims**



A self-storing awning including a frame having a hood portion for attachment above a window, a roller in the hood, rope means for rotating the roller, a fabric awning having one end portion rolled upon the roller, a front bar attached to the other end of the awning fabric, awning arms longitudinally adjustably attached at their upper ends to the front bar, hinge means at the lower ends of the arms for hingedly attaching them to a wall at either side of the window, and spring means urging said awning arms outward.

3,722,572

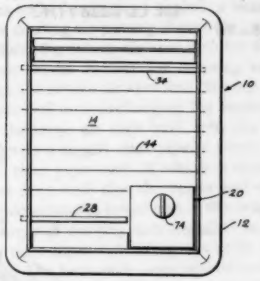
COMBINED WINDOW AND LOUVER CONSTRUCTION

Alvin R. Hall, Cherry Hill, N.J., assignor to Hardis Bros., Inc., Pennsauken, N.J.

Filed March 12, 1971, Ser. No. 123,688

Int. Cl. E06b *9/264*

U.S. Cl. 160—107 **10 Claims**



A combined window and louver construction for adjustable sun control. An adjustable louver arrangement is placed within the space between the glass panes of a double pane hermetically sealed insulating window. The louver arrangement is constructed by interconnecting a series of louver slats by pairs of vertical, multistrand stainless steel cables. Eyelets are attached to the cables to engage small holes in the edges of the slats. Control and orientation of the slats is accomplished by synchronous, vertical, opposing travel of the inboard and outboard cables.

3,722,573

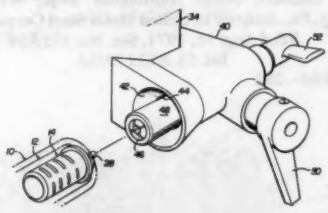
SHADE ROLLER

Martin H. Stark, 1301 Wheeler, Saginaw, Mich.

Filed Dec. 15, 1969, Ser. No. 885,065

Int. Cl. A47h *1/13*

U.S. Cl. 160—326 **3 Claims**



A window shade roller assembly including a shade roller fabricated of laminated paper and an end unit of molded construction to be received in the roller and having provisions for adjusting the length of the assembly. The dimensions and configuration of the roller assembly enable it to be used in conjunction with standard window shade cutting machines.

3,722,574

PROCESS OF MAKING MAGNESIUM OXIDE CORES

John R. Anderson, Bloomfield, N.J., and James S. Perron, Deep River, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 29, 1971, Ser. No. 158,128

Int. Cl. B22c *1/02*

U.S. Cl. 164—41 **3 Claims**

Magnesium oxide is utilized as a water soluble core for producing hollow superalloy parts by investment casting techniques. The core can be formed by mixing slurries of magnesium oxide and magnesium oxychloride, allowing the mixture to harden and then firing the body to form the corresponding oxide.

3,722,575

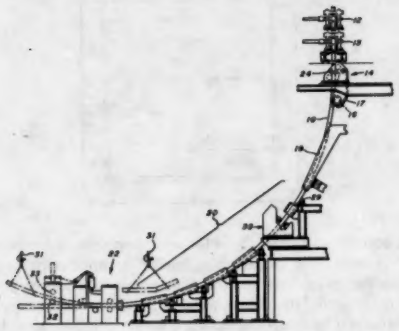
METHOD FOR REMOVING AN ABORTED CASTING FROM A CONTINUOUS-CASTING MACHINE

Gottfried Hofmann, Brentwood Borough, and George F. Schwartz, Hampton Township, both of Allegheny County, Pa., assignors to United States Steel Corporation

Division of Ser. No. 71,037, Sept. 10, 1970. This application May 25, 1972, Ser. No. 256,662

Int. Cl. B22d 11/12

U.S. Cl. 164—70 3 Claims



A method for removing an aborted casting from a continuous-casting machine, in which machine the product is bent from the vertical to the horizontal. The aborted casting is cooled, notched, bent, moved downwardly, and removed. Apparatus is disclosed for restraining the descent of the aborted casting, and for controlling the depth of notches.

3,722,576

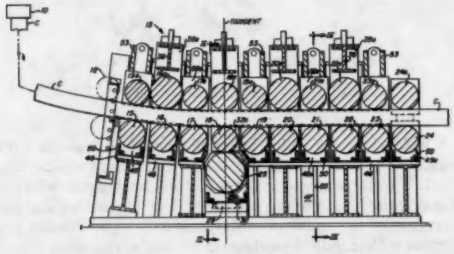
METHOD AND APPARATUS FOR STRAIGHTENING CONTINUOUS CASTING

Francis Gallucci, North Huntington Twp., Westmoreland County, Pa., assignor to United States Steel Corporation

Filed Aug. 16, 1971, Ser. No. 171,834

Int. Cl. B22d 11/12

U.S. Cl. 164—282 8 Claims



A method and apparatus for straightening castings formed in a continuous-casting operation. After a partially solidified casting emerges from a continuous-casting mold, it travels through bending rolls and a curved roll rack which change its direction of travel from vertical to horizontal, but the casting acquires a curved set and must thereafter be straightened. The straightening apparatus of the present invention includes lower and upper series of rolls closely confining a casting, yet avoiding excessive forces such as would damage the casting, which may still have a liquid core. The apparatus has a critical combination of driven and idler rolls of varying diameters, which afford the necessary mechanical strength at reaction points, yet maintain minimum spacing between rolls in each series and allow standardization of the drives for the driven rolls.

3,722,577

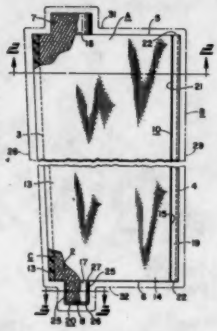
EXPANSIBLE SHELL MOLD WITH REFRACTORY SLIP COVER AND THE METHOD OF MAKING SAME

John M. Webb, Cleveland, Ohio, assignor to Edward J. Mellen, Jr., East Cleveland, Ohio

Filed April 20, 1971, Ser. No. 135,557

Int. Cl. B22c 9/10

U.S. Cl. 164—366 15 Claims



A refractory shell mold for precision metal casting made by a "lost-wax" process and having a core anchored in the shell by attaching portions, at least one of which portions is covered by a small molded refractory slip cover. Such slip cover may be placed on the core in the wax pattern die before the pattern is formed. It is formed to close tolerances to position the core with a degree of accuracy not attained by previously known methods.

3,722,578

PRESSURE MAINTAINING DEVICE AND METHOD FOR PRESSURIZED WATER REACTORS

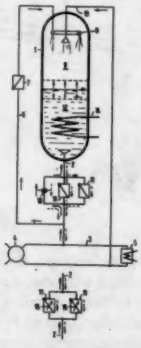
Gerhard Frei, and Maximillian Hintergraber, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed July 16, 1970, Ser. No. 55,352

Claims priority, application Germany, July 19, 1969, P 10 36 844.6

Int. Cl. F24f 3/14

U.S. Cl. 165—1 10 Claims



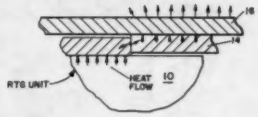
Method of automatically maintaining pressure in a pressure maintaining device of a pressurized water reactor includes

spraying into a steam chamber of the pressure maintaining device in response to increase in pressure in the device or to increase in power output of the reactor, at least a partial flow of water flowing in a pressure water line from the reactor to a steam generator, and additionally spraying into the steam chamber continuously and constantly a lesser flow of water flowing in a line from the steam generator back to the reactor; and device for carrying out the method.

3,722,579
HEAT TRANSFER SYSTEM FOR RADIOISOTOPE GENERATORS

Robert D. Hitchcock, Ventura, and Gene P. McMahan, Oxnard, both of Calif., assignors to The United States of America as represented by the Secretary of the NaVy

Filed March 5, 1971, Ser. No. 121,327
Int. Cl. F28f *13/00*
U.S. Cl. 165—47 **3 Claims**

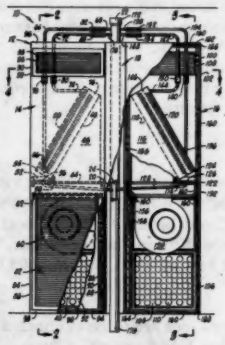


A device to dissipate heat from a radioisotope generator mounted in a separate housing which is designed to protect the generator from excessive water pressure. The device includes a pair of split elongate heat transfer cylinders positioned around the generator within the housing. One of the cylinders is in a contiguous relationship with the generator while the other cylinder is contiguous only to the housing. Both cylinders are in an end abutting relationship so as to provide a path for the flow of heat to the housing.

3,722,580
MODULAR HEATING AND COOLING APPARATUS

Alvin Stanley Braver, Oklahoma City, Okla., assignor to International Air Conditioning, Oklahoma City, Okla.

Filed April 29, 1971, Ser. No. 138,523
Int. Cl. F24f *3/08*
U.S. Cl. 165—50 **11 Claims**

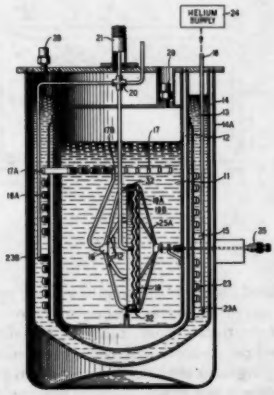


A heating and cooling apparatus for installation in a multiple-story building structure comprising a plurality of vertically stacked heating and cooling units forming a vertical tier extending upwardly through the building structure with one heating and cooling unit located at each floor level for heating or cooling two horizontally adjacent room areas separated by a common vertical partition within which partition the heating and cooling unit is installed. Each heating and cooling unit includes an independent room unit for heating and cooling a respective room area adjacent thereto, the room units being separated from one another within the housing by a riser duct carried by the housing and extending the full height thereof. Each independent room unit comprises a discharge air vent and a return air vent communicating between the room unit and the room area to be heated and cooled, a heat exchanger coil for heating or cooling air passing thereover carried within the unit intermediate the return air vent and the discharge air vent, and a motor-driven blower for drawing air from the room area through the return air vent and blowing the air over the heat exchanger coil and discharging the heated or cooled air through the discharge air vent back into the room area. The riser duct carries a supply riser pipe, a return pipe and a condensate drain riser pipe each of which is sized and positioned in the riser duct such that the upper end of each riser pipe may be connected to the lower end of the respective riser pipe in the heating and cooling unit installed next above to form continuous riser pipes extending upwardly through the entire vertical tier. The heat exchanger coil of each room unit is connected at one end thereof to the supply riser pipe adjacent thereto and is connected at the opposite end thereof to the return riser pipe adjacent thereto whereby heated or chilled fluid heat transfer medium may flow through the coil from the supply riser pipe and back to the return riser pipe. Means are disclosed for collecting and returning moisture which condenses on the heat exchanger coils to the condensate drain riser pipe.

3,722,581
HEAT EXCHANGER WITH ADJUSTABLE CONDUIT TRANSIT SIZE FOR CARRIER

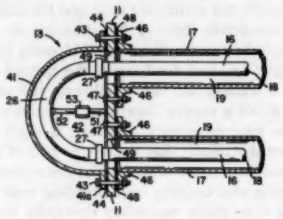
Harold Alfred Sauer, Hatboro, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1970, Ser. No. 83,284
Int. Cl. F28f *27/00*
U.S. Cl. 165—96 **12 Claims**



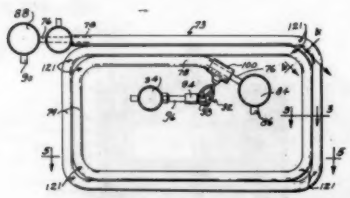
In a heat exchanger employing either a liquid or a gas carrier and particularly adapted for operation in the cryogenic range, efficiency is markedly enhanced and a simple means of temperature programming and control is provided by the use of a heat exchanger conduit with a rectangular cross section together with a means for adjusting the conduit transit width.

3,722,582
END CONNECTOR FOR HEAT EXCHANGERS
Ulf F. Rinecker, San Francisco, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.
Continuation of Ser. No. 849,622, Aug. 13, 1969, abandoned. This application April 14, 1971, Ser. No. 134,024
Int. Cl. F28f 9/00
U.S. Cl. 165—143 9 Claims



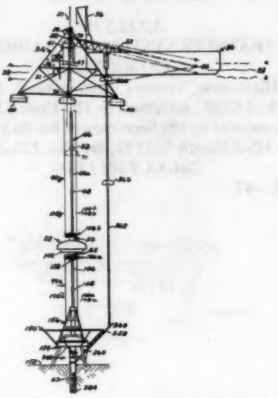
End connector for double tube heat exchangers having parallel sets of concentric tubes forming inner and outer flow passageways. U-shaped return passageways are provided for both of the flow passageways, and these return passageways are in close proximity to each other to enhance heat transfer between them. The end connector is removably mounted to facilitate installation and servicing of the system in which it is used.

3,722,583
REFRIGERATED AIR DRYER
Martin Fiedler, Wooddale, Ill., assignor to Arrow Pneumatics, Inc., Chicago, Ill.
Filed Feb. 22, 1971, Ser. No. 117,265
Int. Cl. F28d 7/12
U.S. Cl. 165—156 9 Claims



A refrigerated air dryer for compressed air systems wherein water vapor and other contaminants are removed from said air by means of controlled condensation. The disclosed system utilizes a novel pump-down arrangement wherein a major portion of the refrigerant may be removed from the cooler coils when the system is not in use, thereby preventing damage due to refrigerant expansion. Further, the coil assembly for the disclosed system utilizes a novel, dual-passage coil construction and method of assembly. More specifically, regarding this latter point, inner and outer tubular members are employed, with a selected section of the inner tubular member collapsed partially during forming to effect engagement of said inner tubular member with said outer tubular member and thereby properly supporting said inner tubular member within said outer tubular member.

3,722,584
APPARATUS AND METHOD FOR DRILLING UNDERWATER
Arthur John Nelson, 3304 Shasta Drive, San Mateo, Calif.
Filed Aug. 13, 1970, Ser. No. 63,507
Int. Cl. E21b 7/12
U.S. Cl. 166—.5 13 Claims

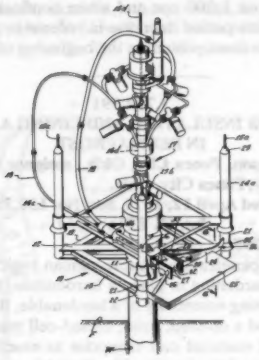


A system forming a well through the floor of a body of water obviating the conventional conductor pipe used to; encase the drill string, seal off the well from the water and convey slurry for return to a vessel at the water surface. Instead to have an integral drill string uninterruptedly torqued by an immersed drilling station fixedly positioned adjacent the floor and adapted to provide continuous boring of the well hole corresponding to the full extent available of a lengthened string suspending above from an immersed support station controlling the bit pressure in the hole as that support descents with penetration. An independently supported articulative conduit in fluid communication between a fluid supply aboard the vessel and the hollow string, and an independently supported remote conduit in fluid communication between the vessel and a diverting assembly terminating the well annulus completes a fluid circuit by which hole borings are removed for processing. The diverting assembly accommodates sealed entry of the bared string, has a diverter directing flow from the well annulus to the remote conduit and has terminating means sealing off the annulus to a mitigated well condition at the seal. A system to line the bored hole concurrent with reassemblage of the string is conducive to furtherance of the expeditious penetration system.

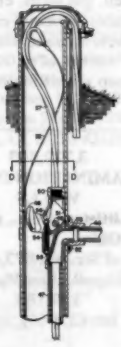
3,722,585
APPARATUS FOR ALIGNING AND CONNECTING UNDERWATER FLOWLINES
Bobby H. Nelson, and Benton F. Baugh, both Houston, Tex., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.
Filed Jan. 12, 1971, Ser. No. 105,919
Int. Cl. E21b 43/01
U.S. Cl. 166—.6 24 Claims

One or more flowlines are to be connected to one or more companion flowline loops extending from a Christmas tree disposed at the upper end of a well bore extending into the formation from the floor of an ocean, or other body of water, at which a flowline guide structure has been installed. Prior to effecting the connection, the end portions of the flowlines are attached to a flange or hub, which is then releasably secured to a carrier at a flowline or pipeline barge, the carrier and flowlines being lowered from the barge toward the well bore where the coupling hub or flange is attached to an alignment

device on the flowline guide structure, which aligns the hub and flowlines with a companion hub secured to the ends of the flowline loops. The carrier is removed and a clamp and seal running tool lowered through the water to position its seal assembly between the aligned flowline hub and flowline loop hub and to relatively pull the hubs against the seal assembly and clamp it therebetween, the running tool then being released.

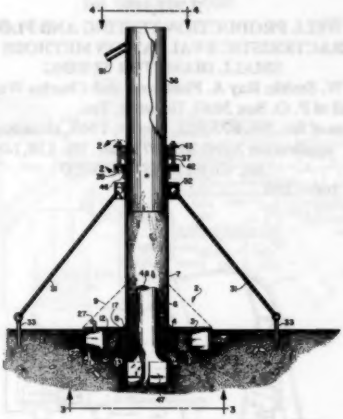


3,722,586
PITLESS WELL ADAPTER
John Gordon Baker, Evansville, Wis., assignor to Baker Manufacturing Company, Evansville, Wis.
Filed Oct. 4, 1971, Ser. No. 186,090
Int. Cl. E21b *33/03*
U.S. Cl. 166—85 **14 Claims**



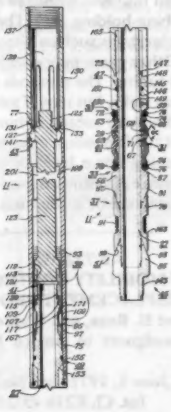
In the case of a jet pump water system two round holes are cut in the well casing below the frostline. A casing fitting is attached fluid-tight to the casing around the two holes. The casing fitting has pressure and suction cylindrical recesses located beyond the inner wall of the casing, coaxial with the casing holes. Pressure and suction pipes are connected to the pressure and suction recesses and extend horizontally below the frostline into a dwelling to a pump and a water delivery conduit. A drop fitting has pressure and suction conduit necks which fit fluid-tight into the pressure and suction recesses. An inner assembly has drop and jet diffuser fittings at the top and bottom respectively of pressure and suction drop pipes. The inner assembly is lowered into the well with the pressure and suction conduit necks pointed in the direction of the conduit recesses. When the necks reach approximate alignment with the recesses an actuator automatically inserts the necks into the recesses and rigidly locks them in. Thus, the pressure and suction pipes and drop pipes are coupled fluid-tight and the inner assembly is rigidly supported. To remove the inner assembly, it is first additionally supported with a hoist, then the conduit necks are withdrawn from the recesses by a manual lift on a control cable (which reverses the actuator) and the inner assembly is lifted out with the hoist. The casing fitting and the drop fitting, which includes the actuator, comprise the invented pitless well adapter.

3,722,587
WELL HEAD CASING SEAL
Simon J. Diaz, 307 Center St., McAllen, Tex.
Filed Nov. 8, 1971, Ser. No. 196,355
Int. Cl. E21b *33/02*
U.S. Cl. 166—88 **9 Claims**



Presented is a structure for sealing the opening around a well head to prevent the inadvertent spillage or escape while permitting the recovery and recycling of drilling fluids during the drilling operation.

3,722,588
SEAL ASSEMBLY
Jack W. Tamplen, R.R. 2, Celina, Tex.
Filed Oct. 18, 1971, Ser. No. 190,085
Int. Cl. E21b *33/128*
U.S. Cl. 166—123 **17 Claims**



A seal assembly, for setting at a predetermined depth in a conduit penetrating subterranean formations, having an elon-

gate mandrel; an elongate tubular surface; an expansible tubular seal element; supporting and compression means for compressing the seal; slips; collet latch for releasably maintaining a set position; interconnection and release means for releasably connecting with a setting tool; connection means for connecting with a terminal device; and characterized by one or more of the desirable features as follows: (1) a bypass means for bypassing fluid when the seal element is not set and blocking flow of fluid once the seal element has been set; (2) a balancing chamber and piston for reducing the force the collet latch is required to sustain; and (3) a safety means for preventing unsetting of the retainer means as long as the differential pressure across the seal is too great. Specific and preferred structures are also disclosed.

3,722,589

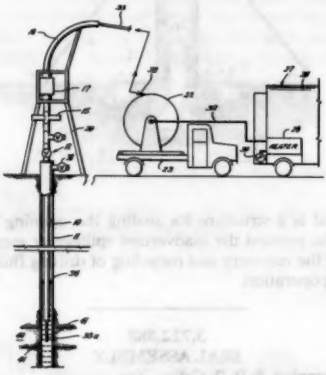
WELL PRODUCTION TESTING AND FLOW CHARACTERISTIC EVALUATION METHODS USING SMALL DIAMETER TUBING

Arthur W. Smith; Ray A. Plummer, and Charles Wayne Johnson, all of P. O. Box 3047, Houston, Tex.

Division of Ser. No. 873,932, Nov. 4, 1969, abandoned. This application April 28, 1971, Ser. No. 138,140

Int. Cl. E21b *43/00, 49/00*

U.S. Cl. 166—250 **8 Claims**



Well methods using small diameter tubing introduced into and withdrawn from the well by an injector apparatus. The tubing is introduced into and withdrawn from the well by the injector from a tubing-holding reel. The methods include the introduction of an inert gas such as nitrogen through the small diameter tubing. Other gases may also be introduced through the small diameter tubing. The methods are especially suitable for use in petroleum wells, but may if suitable be used in water wells. The small diameter tubing is hung in the well with its lower end adjacent the formation to be tested, and injection of gas through the tubing lifts a layer of uncontaminated reservoir fluid to the surface. Continued gas injection accomplishes formation flow characteristic evaluation.

3,722,590

METHOD OF MOBILITY CONTROL IN MISCIBLE DISPLACEMENT PROCESS

H. R. Froning; Syed H. Raza, and Warren S. Askew, all of Ankara, Turkey, assignors to Amoco Production Company, Tulsa, Okla.

Filed June 1, 1971, Ser. No. 149,062

Int. Cl. E21b *43/22*

U.S. Cl. 166—273 **12 Claims**

In displacement by water of a solvent substantially miscible with both water and petroleum through a petroleum-containing reservoir, the mobility of the drive agent is controlled by generating a weak, mobile foam at or near the trailing edge of the solvent slug. Foams found to be suitable for this purpose, and which do not result in plugging the reservoir, are characterized by the fact that they have a maximum viscosity of not more than about 1,000 cps and when confined in a column over a 20-minute period decrease in volume to not more than one-third of the foam present at the beginning of said period.

3,722,591

METHOD FOR INSULATING AND LINING A BOREHOLE IN PERMAFROST

Orwin G. Maxson, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed April 12, 1971, Ser. No. 133,373

Int. Cl. E21b *33/14*

U.S. Cl. 166—295 **4 Claims**

A borehole penetrating a subterranean region is insulated and lined by hardening in place a hardenable, flowable composition consisting essentially of a hardenable, flowable, adhesive cement and a divided, solid, closed-cell material wherein the closed-cell material can comprise as much as about 80 volume percent of the hardenable, flowable composition and wherein the hardened material forming the liner has a hydrostatic crush strength of about 200–5,000 psi, or more. More particularly, syntactic foams are formed in situ to line boreholes penetrating permafrost.

3,722,592

PARAFFIN DEPOSITION INHIBITION IN OIL

Salim M. Bucaram, Plano, and Alfred L. Mortimer, Richardson, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Dec. 14, 1971, Ser. No. 207,987

Int. Cl. E21b *43/00;* **C09k** *3/00*

U.S. Cl. 166—304 **30 Claims**

A method for inhibiting the deposition of paraffin in liquid oil either in the oil well, gas wells, etc., or on the earth's surface by utilizing a stable aqueous emulsion of polyethylene wherein the polyethylene is branched at least in part and has a molecular weight in excess of 6,000, the emulsifier being selected from the group consisting of anionic, nonionic, and cationic emulsifiers.

3,722,593

LIMITING CONTAMINATION IN WASTE DISPOSAL WELLS

Fred H. Poettmann, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 873,669, Nov. 13, 1969, Pat. No. 3,606,925. This application March 29, 1971, Ser. No. 129,180

Int. Cl. B65g *5/00*

U.S. Cl. 166—305 D **13 Claims**

Contamination of underground aquifers by waste materials injected through disposal wells is limited by injecting a mobility buffer ahead of the waste material. The mobility buffer is an oil-external or water-external micellar dispersion having sufficiently low mobility to inhibit fingering of the waste material. A more favorable mobility ratio can be achieved by injecting a series of consecutively mobility graded dispersions into the aquifer.

3,722,594

WELL METHODS USING SMALL DIAMETER TUBING

Arthur W. Smith; Ray A. Plummer, and Charles Wayne Johnson, all of P. O. Box 3047, Houston, Tex.

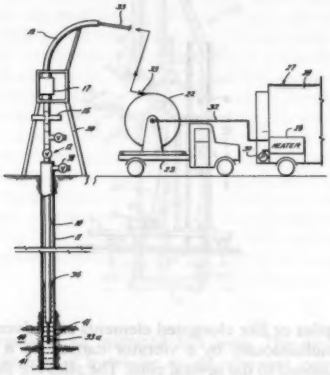
Continuation-in-part of Ser. No. 873,932, Nov. 4, 1969, abandoned. This application May 20, 1971, Ser. No. 145,476

Int. Cl. E21b *21/00, 43/25, 43/27*

U.S. Cl. 166—305 R **9 Claims**

Well methods using small diameter tubing introduced into and withdrawn from the well by an injector apparatus. The

tubing is introduced into and withdrawn from the well by the injector from a tubing-holding reel. Liquids in the well are removed by gas injection as the tubing is introduced. The methods include displacements, fluid injections such as injections of acids, corrosion inhibitors, surfactants, plastics, cement, drilling fluids, alcohols, other solvents, or other chemicals used for treatments in wells and at formations or reservoirs penetrated by wells. The methods also include methods



for the dewatering or drying of pipelines, shafts, ducts, vents, or the like. In most cases, the methods include the introduction of an inert gas such as nitrogen through the small diameter tubing. Other gases may also be introduced through the small diameter tubing. The methods are especially suitable for use in petroleum wells, but may if suitable be used in water wells.

3,722,595

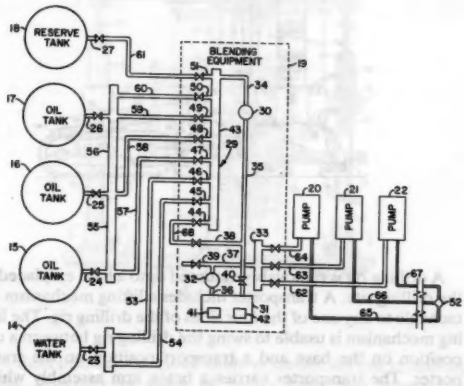
HYDRAULIC FRACTURING METHOD

Othar M. Kiel, Houston, Tex., assignor to Esso Production Research Company, Houston, Tex.

Continuation-in-part of Ser. No. 76,887, Sept. 30, 1970, abandoned. This application Jan. 25, 1971, Ser. No. 109,415

Int. Cl. E21b *43/26*

U.S. Cl. 166—308 **9 Claims**



A fracturing method wherein an emulsified fluid is injected into a subterranean formation under sufficient pressure to open a fracture in the formation. The fracturing method is performed by continuously passing the liquid used as the external phase through a conduit to establish a turbulent flow stream, introducing the liquid used as the internal phase into the flow stream at a plurality of locations to progressively increase the concentration of the internal phase, and continuously injecting the emulsion into the formation under sufficient pressure to open a fracture therein. The method can be employed in water external or oil external systems.

3,722,596

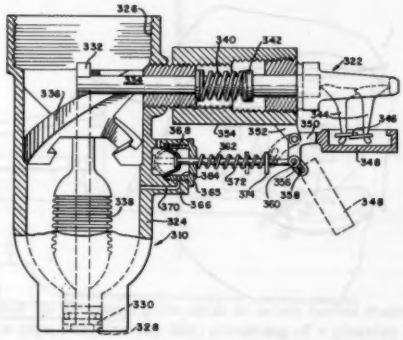
FIRE PROTECTION SYSTEM

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Boston, Mass.

Division of Ser. No. 72,333, Sept. 15, 1970, Pat. No. 3,653,444, which is a continuation-in-part of Ser. Nos. 864,612, Oct. 8, 1969, Pat. No. 3,645,338, and Ser. No. 885,501, Dec. 16, 1969, abandoned. This application Jan. 10, 1972, Ser. No. 216,845

Int. Cl. A62c *37/08*

U.S. Cl. 169—1 A **19 Claims**



A method of fire protection in which extinguishant is delivered to a plurality of discharge heads located in the space to be protected from fire. The number of heads that are opened to deliver extinguishant in response to a fire situation is limited to those located in the immediate vicinity of the fire. In this manner the opened heads are not robbed of valuable extinguishant, and water damage to materials located in areas remote to the fire is minimized. A discharge head utilized in the above method.

3,722,597

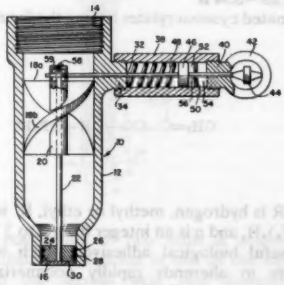
FIRE PROTECTION SYSTEM WITH TIME RESPONSIVE DISCHARGE HEADS

Raymond Friedman, Needham, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Filed Aug. 5, 1971, Ser. No. 169,241

Int. Cl. A62C *37/08*

U.S. Cl. 169—38 **16 Claims**



A fire protection system for buildings and the like in which a plurality of extinguishant discharge heads are mounted in an

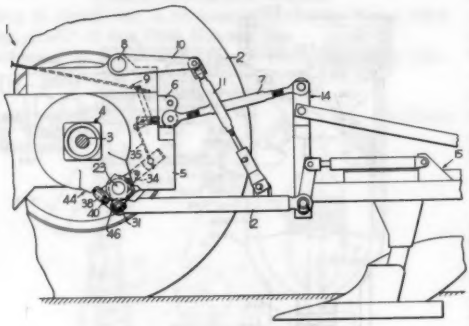
elevated position in the building and are connected to a source of extinguishant. A thermal responsive device is responsive to a fire developing in the building and is adapted to place one or more of the heads in an operable condition for a predetermined time period. The heads that are placed in an operable condition are adapted to be opened in response to a predetermined system condition occuring within the time period.

3,722,598

TORSION BAR DRAFT LOAD ADJUSTER

Donald E. Peterson, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 24, 1970, Ser. No. 101,323
Int. Cl. A01b *63/112*
U.S. Cl. 172—10 **6 Claims**



A draft load sensing mechanism for a vehicle having a torsion bar with means for presetting the minimum draft load and load range sensed by the draft load sensing mechanism.

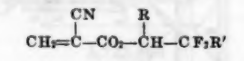
3,722,599

FLUOROCYANOACRYLATES

Jerry E. Robertson, North Oaks; Joseph Kenneth Harrington, Edina, and Elden H. Banitt, Woodbury Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 687,111, Dec. 1, 1967, Pat. No. 3,639,361. This application Aug. 17, 1971, Ser. No. 172,603
Int. Cl. C08f *3/42*
U.S. Cl. 128—334 R **11 Claims**

Fluorinated cyanoacrylates having the formula:



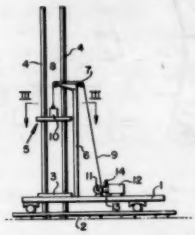
wherein R is hydrogen, methyl or ethyl, R′ is fluorine, $-CF_3$ or $-(CF_2)_nH$, and n is an integer from 1 to 3 have been found to be useful biological adhesives which when applied as monomers to aherends rapidly polymerize, e.g., in the presence of even small amounts of moisture, to form strong bonds. The monomers polymerize to films and can be used biologically as hemostatics and tissue adhesives.

3,722,600

METHOD FOR DRIVING PILES AND LIKE ELEMENTS INTO THE GROUND

Hiroshi Hirata, Tokyo, and Hiroshi Toyoda, Shizuoka, both of Japan, assignors to Asahi Giken Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1971, Ser. No. 147,802
Int. Cl. E02d *7/02*
U.S. Cl. 173—1 **2 Claims**



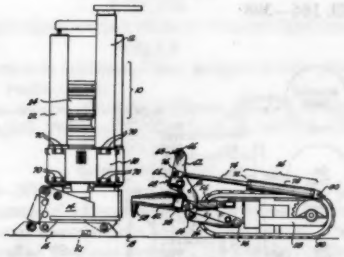
Several piles or like elongated elements are driven into the ground simultaneously by a vibrator carried by a platform which is clamped to the several piles. The piles are themselves outside the path of the vibrator. The platform is shifted along the piles from time to time whereby piles of any length may be driven into the ground by an apparatus arranged closer to the ground than the upper ends of the piles in their initial positions.

3,722,601

DRILLING EQUIPMENT WITH DETACHABLE TRANSPORTER

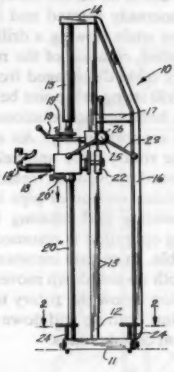
Harold T. Klein, Bellevue, and Harold H. West, Seattle, both of Wash., assignors to The Robbins Company, Seattle, Wash.

Filed Nov. 1, 1971, Ser. No. 194,664
Int. Cl. E21c *11/02*
U.S. Cl. 173—28 **18 Claims**



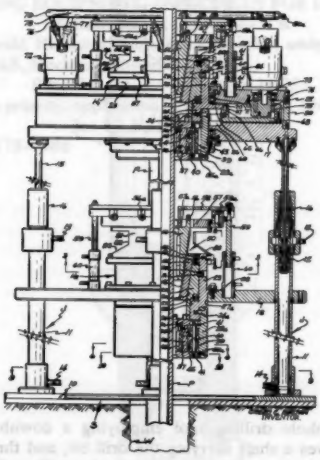
A drilling rig is removably mounted onto a base emplaced at the drilling site. A transporter includes a lifting mechanism attachable to any one of the four sides of the drilling rig. The lifting mechanism is usable to swing the drilling rig between a use position on the base and a transport position on the transporter. The transporter carries a brace arm assembly which projects forwardly from the transporter to be positionable over the base. Hydraulic means on the transporter is used for forcing the brace arm assembly downwardly against the base during use of the lifting mechanism. The brace assembly may also be used for lifting the drilling rig vertically upwardly from the base prior to swinging it downwardly into its transport position.

3,722,602
RAM OPERATED DIAMOND CORE DRILL PRESS
Mark C. Rogers, 4411 Moraga Avenue, San Diego, Calif.
Filed Aug. 4, 1971, Ser. No. 168,823
Int. Cl. E21c *5/00, 11/00*
U.S. Cl. 173—32 **3 Claims**



A hydraulic or air operated drill press. This device is composed primarily of hydraulic or air operated cylinder which provides pressure for a diamond core bit for drilling underwater holes.

3,722,603
WELL DRILLING APPARATUS
Cicero C. Brown, c/o Brown Oil Tools, Inc. P.O. Box 19236, Houston, Tex.
Filed Sept. 16, 1971, Ser. No. 181,067
Int. Cl. E21b *19/16*
U.S. Cl. 173—159 **5 Claims**

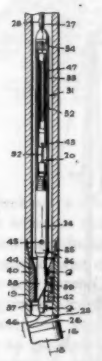


A fluid pressure-operated snubber device for use in drilling wells, generally in place of rotary table and drawworks systems commonly employed for rotary drilling. The device comprises a stationary lower snubbing member and rotatable and vertically reciprocable upper snubbing member operable for rotating drill pipe for drilling a well and for running the drill pipe into and out of the well. Each of the snubbing members includes a set of pipe-gripping wedges movable into and out of pipe-gripping engagement by fluid pressure-operated means and a set of cam actuated shoes for applying torsional forces to the pipe string for rotating the same in drilling and in making-up and breaking-out the sections of the pipe string when running into and out of the well.

3,722,604
PROBE
Goodwin F. Lesher, 115 Sante Fe, Houston, Tex.
Filed Jan. 21, 1971, Ser. No. 108,414
Int. Cl. E21b *11/00*
U.S. Cl. 175—19 **1 Claim**

A device for penetrating the earth to locate buried matter, such as a pipe line, and the like, consisting of a plurality of connecting sections terminating at one end in a handle and at the other end having a spherical member of greater outside diameter than the outside diameter of the respective sections.

3,722,605
APPARATUS AND METHOD FOR DETERMINING RELATIVE ORIENTATION OF TWO WELLS
Carroll E. Isham, Buena Park, Calif., assignor to Scientific Drilling Controls, Costa Mesa, Calif.
Filed Feb. 3, 1971, Ser. No. 112,328
Int. Cl. E21b *47/00, 7/04*
U.S. Cl. 175—40 **17 Claims**



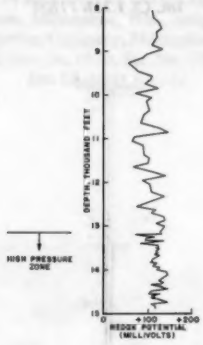
The relative positioning of two wells is determined by receiving at a subsurface location in one of the wells sound emanating from the second well, and determining the direction of the second well from the first by reference to the direction of approach of the sound.

3,722,606

DETECTING ABNORMAL FORMATION PRESSURE DURING DRILLING OF A WELL

Walter H. Fertl, and R. J. Cavanaugh, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 16, 1971, Ser. No. 171,902
Int. Cl. E21b *47/00*
U.S. Cl. 175—41 **8 Claims**



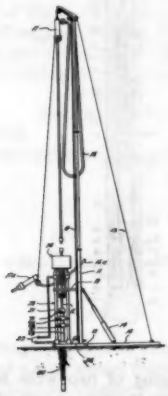
An early warning detection method for predicting abnormal formation pressure in subterranean rock strata before it is drilled. The technique is to measure, on a sample removed from the well bore, the tendency of an atomic particle to escape from the environment, such as the pH or redox potential, while the well is being drilled, in the normally pressured rock strata existing above the abnormally pressured formations. When variations are observed in the rate of change of escape tendency with depth, drilling procedures are altered to meet the requirements of the formation which is about to be penetrated by the drill bit.

3,722,607

METHOD FOR DRILLING A WELL

Jack H. Ray, Houston, Tex., assignor to Tenneco Oil Company, Houston, Tex.

Filed April 8, 1971, Ser. No. 132,323
Int. Cl. E21b *7/00*; **E21c** *5/00, 1/00*
U.S. Cl. 175—57 **3 Claims**



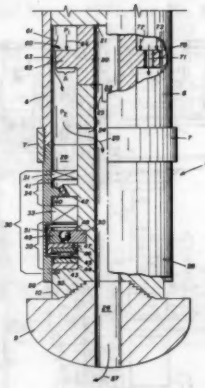
A method for drilling an oil or gas well or the like which does not utilize a conventional derrick and rig which requires several operators and extensive moving equipment and the like, but rather the drilling is carried out with a minimum of simplified equipment. The invention contemplates mounting a generally up and down travelling rotary table over a well bore site. It includes the step of suspending a drill string from the rotary table and holding the drill string therein against downward movement relative thereto, with the drill string having drill collars and a drill bit on the lower end thereof. The rotary table is simultaneously rotated and lowered to effect drilling of the well bore while flowing a drilling fluid through the drill string. Thereafter, rotation of the rotary table is terminated and the rotary table disengaged from the drill string while supporting the drill string at a point below the rotary table. The drill string is held against rotational and downward movement during this supporting step. An additional section of pipe is placed in the rotary table and held therein against rotational and downward movement relative thereto. The lower end of the additional section of pipe is connected with the drill string by lowering and rotating the rotary table. Thereafter, the drilling operation is resumed by rotating and lowering the rotary table. In certain instances, the drill string may be held against both up and down movement while being supported at the position below the rotary table and likewise may be supported against both up and down movements relative to the rotary table at certain times.

3,722,608

WELL DRILLING

Joseph H. Faulk, Dallas, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 4, 1971, Ser. No. 168,835
Int. Cl. E21b *3/08, 7/00*
U.S. Cl. 175—65 **8 Claims**

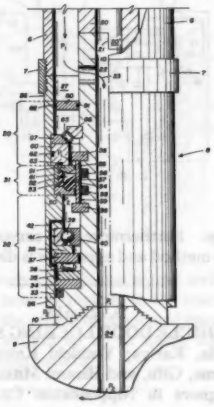


A downhole drilling tool employing a downhole motor which drives a shaft carrying the drill bit, and thrust means both for causing a pressure drop in the drilling fluid in the vicinity of the shaft and for applying the force created by the pressure drop to the shaft thereby increasing the total force applied to the bit. A method for reducing bearing wear while drilling with a downhole motor when bit weight for drilling is applied to the shaft of the downhole motor from a housing, the shaft communicating with the housing through bearings, comprising passing drilling fluids between the shaft and housing, causing a pressure drop of the drilling fluid, and applying the force resulting from the pressure drop to the shaft.

3,722,609
DRILLING TOOL AND BEARING SYSTEM

Loyd R. Kern, Irving, and John H. Striegler, Richardson, both of Tex., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Aug. 9, 1971, Ser. No. 170,079
Int. Cl. E21b 3/08
U.S. Cl. 175—92 8 Claims

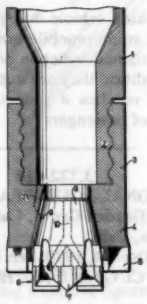


A bearing system in an annulus between a shaft and a housing, the bearing system containing a seal means, and the seal means contacting a sealing surface means which maintains full sealing contact with the seal means notwithstanding lateral displacement of the shaft. A downhole drilling tool employing the above bearing system together with a downhole motor operably connected to the shaft of the bearing system, the other end of the shaft being adapted to carry a drilling bit.

3,722,610
DRILLING EQUIPMENT, ESPECIALLY FOR DRILLING IN EARTH OR LOOSE ROCK

Karl Harald Hornsten, Sollentuna, Sweden, assignor to Nya Asfalt AB, Stockholm, Sweden

Filed Feb. 17, 1970, Ser. No. 11,955
Claims priority, application Sweden, Feb. 28, 1969, 2841/69
Int. Cl. E21b 9/35, 17/04
U.S. Cl. 175—386 3 Claims

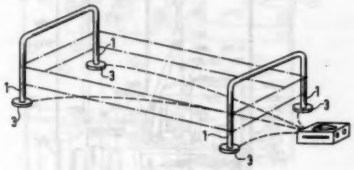


A compound drill bit consisting of an outer ring-shaped drill bit and an inner central drill bit which is detachably connected to the outer drill bit in a manner to permit simultaneous operation when impact and rotational forces are applied. The impact and rotational forces are transmitted to them both through a casing which is attached to the outer ring-shaped rill bit. The two drill bits are so interconnected as to make it possible to expel the inner drill bit from the outer drill bit while both drill bits and the casing are positioned in the bore hole produced by them. Means are provided for passage of flushing fluid between the inner and outer drill bits.

3,722,611
PATIENT SCALES

Erkki Tapio Tirkkonen, Kajavarannantie 3 as. 5, Helsinki 20, Finland

Filed Feb. 3, 1971, Ser. No. 112,111
Claims priority, application Finland, Feb. 5, 1970, 316/70
Int. Cl. G01g 19/52
U.S. Cl. 177—144 3 Claims

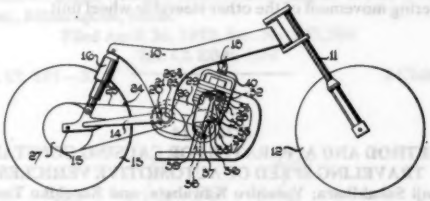


The invention disclosed is a device for weighing a patient confined in bed by using weight detecting elements or load cells disposed between each of the standard legs of the bed and the floor. The weight detecting elements are positioned in communication with a counting and indicating means for identification of the weight of the patient.

3,722,612
CHAIN DRIVEN VEHICLES

Alec Arnold Constantine Issigonis, Edgbaston, Birmingham, and Bernard Hooper, Wordsley, near Stourbridge, both of England, assignors to Norton Villiers Limited, Wolverhampton, England

Filed June 17, 1970, Ser. No. 46,916
Int. Cl. B60k 5/12, 5/06
U.S. Cl. 180—32 3 Claims



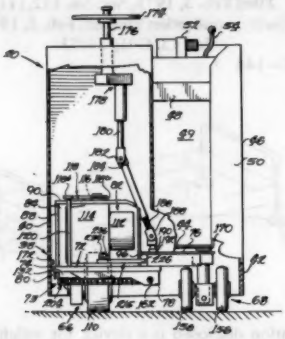
The specification discloses a chain driven motor cycle in which the driven road wheel is mounted on a swinging fork which is pivotally mounted on the motor cycle frame or power unit so that the fork cannot twist about an axis normal to its pivot axis. The power unit is pivoted to the frame and the balance of the moving masses of the power unit is such that the reciprocating masses are substantially unbalanced and cause the power unit to oscillate about its pivot axis, such oscillations being damped by resilient means between the power unit and frame. The power unit is preferably mounted at or adjacent its instantaneous center of rotation with respect to the out of balance forces produced by the reciprocating masses so that the impulsive forces caused thereby are substantially not transmitted to the frame. The invention is also applicable to snowmobiles.

3,722,613

POWER DRIVEN MATERIAL HANDLING TRUCK

Donald Jack De Priester; David C. Horney, both of Muscatine, and Robert H. Mangels, Buffalo, all of Iowa, assignors to Hon Industries Inc., Muscatine, Iowa

Filed Dec. 21, 1970, Ser. No. 100,191
Int. Cl. B60k *17/30*
U.S. Cl. 180—52 9 Claims



Disclosed herein is a material handling truck of the stand-up rider type having four support wheel units, including two steerable support wheel units, one of which comprises a power driven traction wheel. The two steerable wheel units are mounted on a rigid subframe joined to the main frame of the truck for pivotal movement about a longitudinal axis so that the wheels can accommodate to uneven terrain and thereby maintain the traction wheel in effective contact with varying subjacent surfaces. The second steerable wheel unit comprises a pair of spaced wheels which have independent horizontal tilting movement about a mounting axis spaced below the axis of rotation of these wheels to minimize any tendency of this wheel unit to cock. A telescoping universal drive connects a steering wheel on the vehicle with a sprocket chain on the subframe for steering the traction wheel. An internesting compensating linkage system on the subframe provides positive steering movement of the other steerable wheel unit.

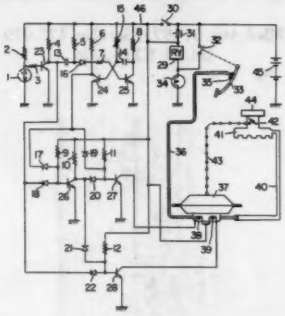
3,722,614

METHOD AND APPARATUS FOR CAUSING CONSTANT TRAVELING SPEED OF AUTOMOTIVE VEHICLES

Naoji Sakakibara; Yasuhiro Kawabata, and Korehiko Tsukuba, all of Kariya, Japan, assignors to Aisin Seiki Kaisha, Kariya-shi, Japan

Filed Aug. 5, 1970, Ser. No. 61,373
Claims priority, application Japan, Aug. 6, 1969, 44/62164; Aug. 9, 1969, 44/63168
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 E 6 Claims

A method and an apparatus for causing constant traveling speed of automotive vehicles, in which the travelling speed of a vehicle is sensed as a pulse width, this pulse width is compared with a pulse width corresponding to a adjustable predetermined desired value, thereby to produce a difference pulse width, and a servomotor is driven for a period of time proportional to said difference pulse width. The method and apparatus utilize further a system which actuates so that when variation of the vehicle speed occurs after determination of a predetermined speed, this predetermined speed is temporarily varied within a suitable range in response to magnitude of the speed variation in such a manner that difference between the actual speed and the predetermined speed of the vehicle



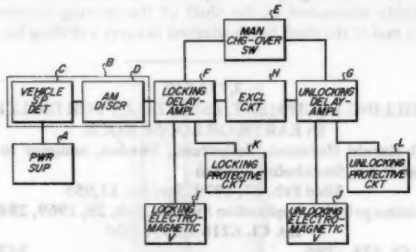
becomes large. Furthermore, a servo-motor mechanism adapted to the method and apparatus is disclosed.

3,722,615

VEHICLE DOOR LOCKING SYSTEM

Masashi Okada, Kariya; Yoshichi Kawashima, 16, Kamurocho-2-chome, Gifu, and Hisami Mitsueda, Mie-ken, all of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Japan

Filed July 19, 1971, Ser. No. 163,837
Claims priority, application Japan, Sept. 2, 1970, 45/76890
Int. Cl. B60r *21/00*
U.S. Cl. 180—112 1 Claim



A system for locking vehicle doors wherein the doors of a vehicle, especially, an automobile are locked or unlocked by the operation of a manual switch in order to prevent theft, for example, and in addition they are automatically locked when the vehicle speed reaches a predetermined level, thereby securing the safety of passengers.

3,722,616

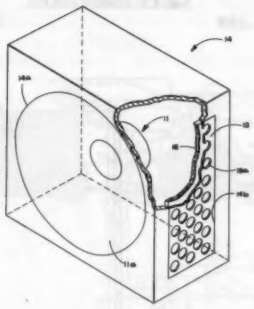
DIRECTIONAL LOUDSPEAKER SYSTEM

Bobby R. Beavers, Garden Grove, Calif., assignor to LTV Altec, Inc., Anaheim, Calif.

Filed Dec. 14, 1970, Ser. No. 97,960
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B 2 Claims

A loudspeaker system includes a loudspeaker mounted in an enclosure, the enclosure having a front port for exiting the sound energy radiated by the front of the speaker cone and a port, or ports, or other areas for exiting the sound energy radiated by the rear of the speaker cone which is out of phase with the front radiation. The port, ports or areas through which the energy from the back cone surfaces is radiated is made acoustically resistive so as to delay the sound energy in

conjunction with the acoustic compliance of the enclosure. The dimensions of the enclosure, the effective resistivity, and the total area from which the speaker rear energy is radiated are chosen so that the sound energy from the rear of the



speaker cone effectively cancels out sound arriving from the front of the speaker cone at regions to the rear of the enclosure. This minimizes the effective acoustical energy to the rear of the loudspeaker system so as to make for a forwardly directed sound radiation pattern.

3,722,617

FLAT DIAPHRAGM FOR SOUND TRANSDUCERS

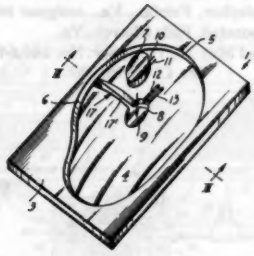
Jose Juan Bertagni, 1027 Hernandarias St., Buenos Aires, Argentina

Filed May 31, 1972, Ser. No. 258,335

Claims priority, application Argentina, June 8, 1971, 236069; June 8, 1971, 236060

Int. Cl. G10k *13/00;* **H04r** *7/00*

U.S. Cl. 181—32 R **11 Claims**



Flat diaphragm for sound transducers having a flat front face and rear face defining a central figure portion connected to an electromagnetic assembly and surrounded by a marginal vibration damping portion of larger thickness than the adjacent peripheral zone of said figure portion, an endless channel member in said diaphragm, surrounding said figure portion to better acoustically separate said figure portion from said marginal vibration damping portion and if certain tones are to be emphasized a substantially straight metal band resting on said figure portion arranged between said electromagnetic assembly and said endless channel member.

3,722,618

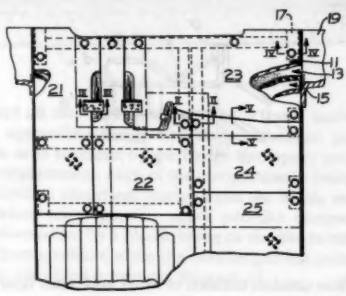
SANDWICH DECK CONSTRUCTION

Max E. Butterfield, Peoria; Richard H. Hoerr, East Peoria; Alan L. McLees, Washington, and Frederick D. Proksch, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 28, 1970, Ser. No. 101,635

Int. Cl. F16f *7/00*

U.S. Cl. 181—33 G **9 Claims**



A noise and dirt blocking deck construction for an earthmoving machine comprising two rigid layers separated by a layer of resilient material. Each layer comprises multiple sections joined at offset edges to eliminate sound and dirt transmission. Attachment means are used which reduce noise transmission and control deformation of the resilient elements of the construction.

3,722,619

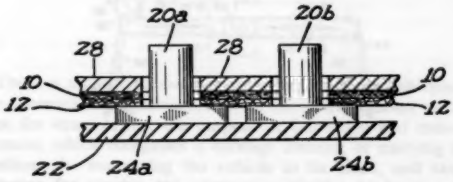
ACOUSTIC DECOUPLER

Roland W. Higgs, Orchard Lake, Mich., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed April 26, 1972, Ser. No. 247,706

Int. Cl. E04b *1/84*

U.S. Cl. 181—33 G **2 Claims**

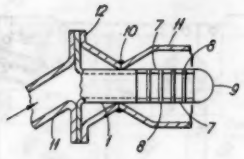


An acoustic decoupler which isolates both shear and longitudinal acoustic waves comprises first and second layers of precompressed balsa wood. The first and second layers lie in substantially parallel planes. The unidirectional grain structure of each of the first and second layers is aligned with the substantially parallel planes, and the unidirectional grain structure of the first layer is aligned essentially perpendicular to the unidirectional grain structure of the second layer.

3,722,620
SILENCER

James Brian Erskine, Norton, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed July 19, 1971, Ser. No. 163,835
Claims priority, application Great Britain, July 28, 1970, 36,505/70
Int. Cl. F01n 1/08, 7/18
U.S. Cl. 181—57 10 Claims

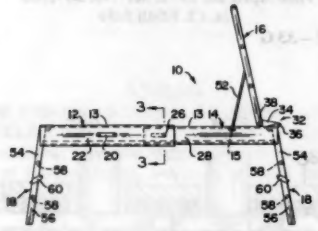


A gas flow conduit consists of inner and outer flow sections whose end portions overlap. Communication between the sections is afforded by slots in the wall of the overlapped inner section. This design controls the pattern of gas flowing through it and leads to, for example, a reduction in acoustic noise and to better gas flow measurement.

3,722,621
LADDER BENCH

Mattie Lou Jones, 1913 N. Dale Mabry, Tampa, Fla.

Filed June 1, 1971, Ser. No. 148,712
Int. Cl. E04g 1/30
U.S. Cl. 182—118 12 Claims



A device comprising a substantially horizontal telescopically arranged bench surface mounted on ladder-like supports located at each end of the bench. These ladder supports are extendable so that the bench may be raised to scaffold height. In addition these supports are hingedly attached to the bench such that the drive may be collapsed for storage or transporting. Also attached to the bench is a single ladder-like extension collapsibly mounted on a double action hinge.

3,722,622
FOLDING AND COLLAPSIBLE LADDERS

Edgar A. Lauring, Forest Point, Island View Road, International Falls, Minn.

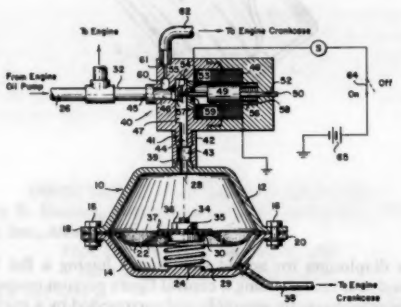
Filed March 18, 1971, Ser. No. 125,689
Int. Cl. E06c 1/383
U.S. Cl. 182—159 3 Claims

A folding and collapsible ladder wherein the rungs are pivotally attached to the side rails and adjacent rungs are attached to the side rails in different planes, i.e., adjacent rungs are offset. To collapse or fold the ladder into a narrow but slightly longer mass, the rungs fold down like a closing parallelogram until the rungs are substantially parallel to the side rails. Rigidity of the ladder is provided by one or more braces pivotally attached at one end to one side rails and the opposed end of the braces provided with fastening means to removable secure the braces to the other side rail.

3,722,623
PRELIMINARY LUBRICATION DEVICE

Donald E. Waldecker, Fairfax, Va., assignor to RAM Enterprises, Incorporated, Falls Church, Va.

Filed May 25, 1971, Ser. No. 146,640
Int. Cl. F01m 7/00
U.S. Cl. 184—6.3 11 Claims



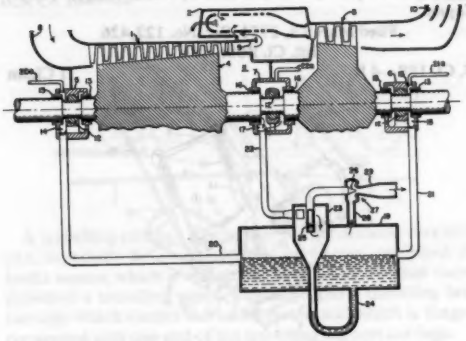
A device for providing adequate lubrication to lubricant pump-including, pressure-lubricated equipment during start-up of the equipment.

3,722,624

BEARING SEAL AND OIL TANK VENTILATION SYSTEM

Bruce O. Buckland, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 7, 1971, Ser. No. 150,378
Int. Cl. F16n 39/00
U.S. Cl. 184—6.11 9 Claims



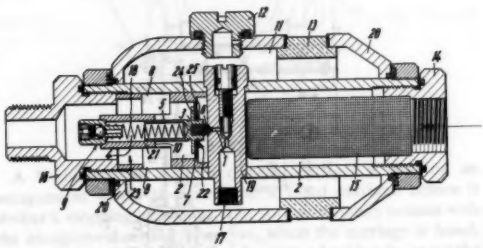
High pressure leakage air into a bearing housing in a gas turbine drives an eductor pump which ventilates the oil tank and removes oil vapor from the other bearing housings while providing a seal.

3,722,625

LUBRICATING DEVICE FOR PNEUMATIC TOOLS

Alfred Mathes, Hauptstrasse 30, 6382 Friedrichsdorf, Germany

Filed Dec. 17, 1971, Ser. No. 209,258
Claims priority, application Germany, Dec. 22, 1970, P 20 63 157.6
Int. Cl. F16n 7/34
U.S. Cl. 184—55 A 7 Claims



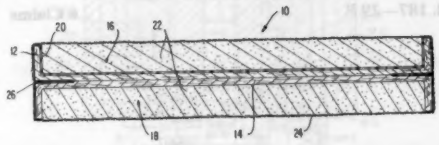
A lubricating device for pneumatic tools, in particular pulsating pneumatic tools such as pneumatic nail drivers and the like. The device consists of an oil pressure chamber surrounding an air pressure chamber through which latter chamber air under pressure is adapted to pass. The oil pressure chamber communicates with the air pressure chamber by means of a valve chamber and valve assembly with opening and closing of communication between the two chambers being controlled by air pressure differential, with communication between the two chambers being closed when the tool is not being operated and there is no air flow. The communication between the two chambers being open during air flow passage and means are provided to retard closing of the communication after cessation of air flow through the device to the tool.

3,722,626

CAR PORT OIL DRIP MAT

Louis J. Stack, 704 S. Magnolia St., Albany, Ga.

Filed July 16, 1971, Ser. No. 163,386
Int. Cl. F16n 31/02
U.S. Cl. 184—106 9 Claims



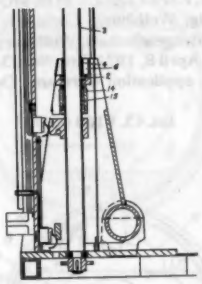
A car port oil drip mat constituted by a frame including a peripheral upstanding flange and an intermediate partition dividing the area bounded by the flange into upper and lower pan-like compartments, each of the compartments being filled with a particulate absorbent material and the whole enclosed within a fabric envelope, the upper pan-like compartment rendered oil-resistant by a plastic lining or the like to retain oil that drips from a vehicle while the bottom portion constitutes a blotter for absorbing previously dripped oil.

3,722,627

TWO-COLUMN LIFTING PLATFORM

Heinz Fricke, Pfungstadt, Germany, assignor to Gebr. Hofmann KG. Machinenfabrik, Darmstadt, Germany

Filed Oct. 22, 1971, Ser. No. 191,878
Claims priority, application Germany, Oct. 28, 1970, P 20 52 869.2
Int. Cl. B66f 7/14
U.S. Cl. 187—8.41 8 Claims

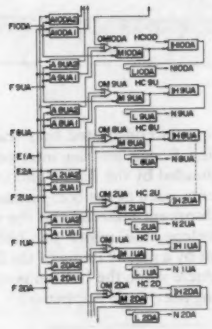


There is disclosed a two-column lifting platform with spindle-operated lifting carriage, e.g., for use in lifting motor vehicles, for example, for the purpose of inspection and maintenance, which comprises a carriage forming or carrying a platform for supporting the vehicle to be lifted, and two columns for moving the carriage vertically. At least one column comprises a threaded spindle carrying a nut secured to the lifting carriage, rotation of the spindle thus displacing the carriage. The carriage is also guided in its vertical movements by suitable lateral guide means. The spindle passes through a stepped bore in the lifting carriage, wherein a ring of oil-absorbent material is fitted in the stepped bore so that the inside peripheral face of the ring lies in an oil-transferring relationship against the periphery of the spindle and the ring is held in position by a flange sleeve which is pressed into the stepped bore and which defines a space for containing lubricating oil, the flange portion of the flange sleeve having one or more openings through which oil can flow to saturate the ring.

3,722,628
ELEVATOR CONTROL SYSTEM

Takeo Yuminaka; Isao Inuzuka; Tatsuo Iwasaka, all of Katsuta, and Toshio Ochi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed April 6, 1971, Ser. No. 131,701
Claims priority, application Japan, April 8, 1970, 45/29348
Int. Cl. B66b *1/18*
U.S. Cl. 187—29 R 6 Claims

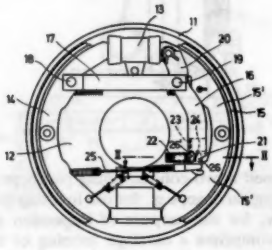


In operating a plurality of elevator cars serving a plurality of floor landings, an elevator control system in which the response of a succeeding car to hall calls from predetermined forward floors is limited when the space between the succeeding car and a preceding car is shortened. As a result, the succeeding car catches up with the preceding car and leads it.

3,722,629
DEVICE FOR INDICATING THE ACTUATED POSITION OF A MANUAL BRAKE AND OF THE WEAR OF THE BRAKE LINING, ESPECIALLY FOR MOTOR VEHICLES

Manfred Totschnig, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed April 8, 1971, Ser. No. 132,284
Claims priority, application Germany, Oct. 31, 1970, P 20 24 661.1
Int. Cl. F16d *66/02*
U.S. Cl. 188—1 A 9 Claims

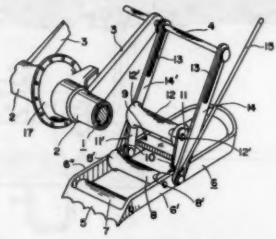


In a brake having a plurality of relatively movable brake elements, a device for selectively moving the brake elements manually and/or by foot relative to each other, and an adjusting device to adjust the distance between the brake elements upon their wear, a device for indicating when the brake elements have been actuated manually and when a predetermined wear between the brake elements has been exceed, the indicating device includes a force transmitting arrangement associated with the manual moving device and with the adjusting device and adapted to move along a predetermined path upon actuation by the two last-mentioned devices, and an electric contact located in the above path and actuated by the force transmitting device upon movement thereof along the above path, the contact forming part of a signal circuit becoming energized upon actuation of the contact.

3,722,630
EMERGENCY STOPPING DEVICE FOR A WHEELED VEHICLE

Manzo Wakabayashi, 7-13, 2-chome, Nishirokugo, Tokyo, Japan

Filed March 9, 1971, Ser. No. 122,426
Int. Cl. B60t *1/04*
U.S. Cl. 188—4 R 1 Claim

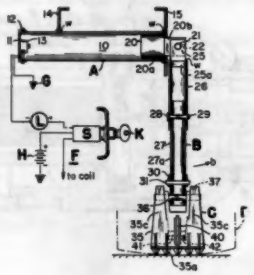


Emergency stopping device comprises a frame mounted to swing between a position in the path of travel of a rear wheel and a position clear thereof. There is a sliding connection between the frame and its support so that the wheel can ride up on it, and the frame is provided with rollers which permit the wheel to rotate thereon while the vehicle forward motion of the vehicle is braked by friction between the frame and the road.

3,722,631
VEHICULAR CHOCK

Walter B. Lowrie, 104 Newkirk Avenue, Glenshaw, Pa.

Filed Aug. 20, 1971, Ser. No. 173,398
Int. Cl. B60t *1/04*
U.S. Cl. 188—4 R 16 Claims



A tire-engaging wheel-blocking or chocking device for a motor vehicle has three parts comprising an overhead tubular assembly for mounting on the under side of the vehicle adjacent a wheel that is to be chocked, a collapsible-expandable suspended arm assembly that is swingably and rotatably carried by a stub shaft for movement within a stowing tube of the mounting assembly when the vehicle is to be operated, and a chock assembly which is bifurcated at its back end and swung from a lower end of the arm assembly. The arm assembly is made up of a pair of telescopically mounted and guided arm members. A finger lift means is pivotally carried by the bifurcated back end portion of a chock shoe of the chock assembly for engaging a road surface to tilt the shoe to release it from a cooperating chocking position with respect to an associated wheel assembly.

3,722,632

TRAVELLING CARRIAGE MECHANISM FOR AERIAL CABLE CARS

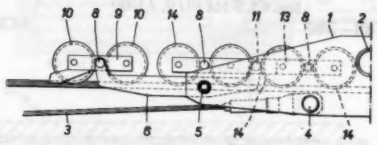
Fritz Feuz, Canton of Bern, Switzerland, assignor to Von Roll AG. Werk, Bern, (Canton), Switzerland

Filed Feb. 24, 1971, Ser. No. 118,395

Claims priority, application Switzerland, Dec. 17, 1970, 18749/70

Int. Cl. B61h 9/02

U.S. Cl. 188—42 5 Claims



A travelling carriage mechanism for aerial cable cars or the like, especially for swinging aerial cable cars, equipped with brake means, which is manifested by the features that there is provided a travelling support carriage and a travelling brake carriage which carries the brake means and which is hingedly connected with one end of the travelling support carriage.

3,722,633

CARRIAGE BRAKE DEVICE

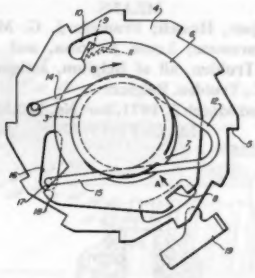
Karl Wenderoth, Hohenweg 31, Germany, assignor to Adlerwerke vorm. Heinrich Kleyer A.G., Frankfurt, Germany

Filed May 10, 1971, Ser. No. 141,651

Claims priority, application Germany, Dec. 19, 1970, P 20 62 755.8

Int. Cl. F16d 63/00

U.S. Cl. 188—68 4 Claims



A U-shaped slip ring frictionally engages a boss on an escapement wheel to decelerate a freed carriage before it strikes a stopping abutment. The spring normally rotates with the escapement wheel. However, when the carriage is freed, the spring is held stationary and exerts a braking force on the escapement wheel.

3,722,634

DISC BRAKE ANTI SQUEAL MEANS

Takeo Ogasawara, Nagoya, and Masakazu Ishikawa, Toyota, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya-shi, Aichi-ken and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan

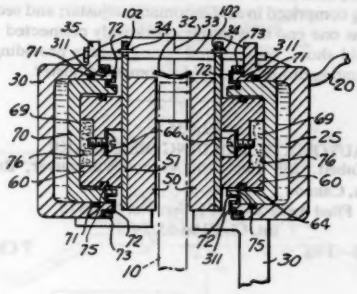
Filed Sept. 18, 1970, Ser. No. 73,358

Claims priority, application Japan, Sept. 29, 1969, 44/78019

Int. Cl. F16d 65/00

U.S. Cl. 188—73.5 16 Claims

A disc brake of simple construction wherein an intermediate member is interposed between the brake pad and the brake actuating piston. Anti-friction means extends between the transverse adjacent surfaces of the piston and the intermediate member so that vibrations from the brake pad are thus not transmitted to the piston and brake squeal is effectively eliminated.



3,722,635

AUTOMOTIVE WHEEL BRAKE MECHANISM FITTED WITH AUTOMATIC BRAKE GAP ADJUSTER

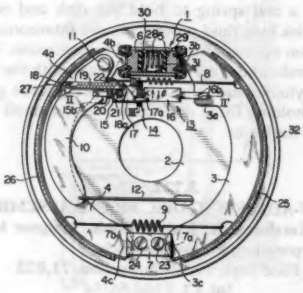
Tatsumi Torii, and Haruo Miyajima, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Aichi Pref., Japan

Filed Jan. 29, 1971, Ser. No. 111,062

Claims priority, application Japan, Feb. 2, 1970, 45/9448; Feb. 2, 1970, 45/9449

Int. Cl. F16d 65/54

U.S. Cl. 188—79.5 P 6 Claims



This invention relates to a wheel braking mechanism comprising an automatic brake gap adjuster, which is especially advantageous for use in automotive service.

A representative conventional automotive wheel brake assembly fitted with an automatic brake gap adjuster comprises generally: a rotatable brake drum adapted for unitary revolution with a wheel to be braked of an automotive vehicle; a backing plate fixedly mounted on a stationary part of an axile for said wheel; a pair of brake shoes pivotably mounted on said backing plate and expandable towards and against said drum; an expandable hydraulic actuator mounted on said backing plate and adapted for engaging with one end of each of said shoe; a stationary anchor mounted on said backing plate and adapted for engaging with other end of each of said shoes; back spring means adapted for release of pressure contact of said brake shoes with said brake drum; and an automatic brake gap adjuster arranged in proximity of said hydraulic actuator and between said brake shoes.

The characterizing feature of the invention resides in the provision of a parking lever pivotably mounted with its one end on one of expandable; mechanical expansion means for

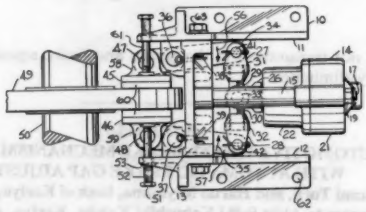
expanding said shoes and in cooperation with said parking lever; first spring means provided between automatic gap adjuster and either of said shoes; screw shift means; a ratchet wheel means, said screw shift means and said ratchet wheel means being comprised in said automatic adjuster; and second spring means one end of which is operatively connected with either of said shoes, said second spring means providing its force in actuating direction of said automatic adjuster.

3,722,636

AUTOMATIC HOLDING DISK BRAKE

Jack R. Kobelt, 235 East 5th Avenue, Vancouver, British Columbia, Canada

Filed April 23, 1971, Ser. No. 136,873
Int. Cl. F16d 65/24
U.S. Cl. 188—170 **7 Claims**



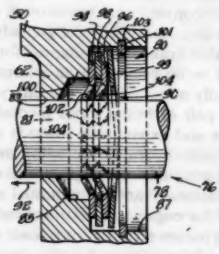
This disclosure pertains to that class of braking devices known as disk brakes, and more particularly to disk brakes which are automatically actuated by a fluid to hold or release a shaft, the fluid itself being energized directly or indirectly by the machine of which the aforementioned shaft is a part. A preferred embodiment of the invention is disclosed in detail wherein a disk is mounted on a propeller shaft coupled to a geared transmission, two brake shoes of the invention being actuated by a coil spring to hold the disk and actuated to release the disk by a fluid power cylinder interconnected with the lubrication system of the geared transmission. The aforementioned brake shoes are interconnected with the coil spring and power cylinder such that a small spring force generates a large brake holding force and, conversely, a small fluid pressure releases the brake.

3,722,637

SELF-ADJUSTING DISC BRAKE ASSEMBLY

Osborn A. Kershner, St. Joseph, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Sept. 10, 1970, Ser. No. 71,022
Int. Cl. F16d 65/54
U.S. Cl. 188—196 P **7 Claims**



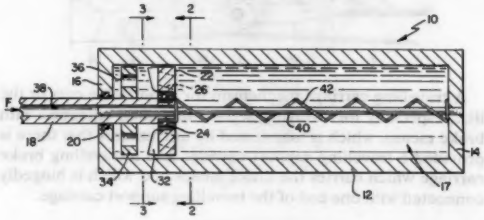
The invention relates to a self-adjusting brake assembly for retarding the rotational movement of a shaft or axle having a plurality of rotary disc members mounted for both rotational movement therewith and axial movement relative thereto. The assembly includes a plurality of fixed discs carried by a stationary housing, and an actuator plate hydraulically movable so as to force the disc members into frictional engagement with the fixed discs in order to stop the shaft or axle. The assembly is provided with automatic adjuster means for maintaining constant the distance required for moving the actuator plate into engagement with the disc members and discs.

3,722,638

POWER ABSORBER

John W. McClure, Charleston, S.C., assignor to Auco Corporation, Charleston, S.C.

Filed Aug. 27, 1971, Ser. No. 175,565
Int. Cl. F16f 9/19, 13/00
U.S. Cl. 188—280 **3 Claims**



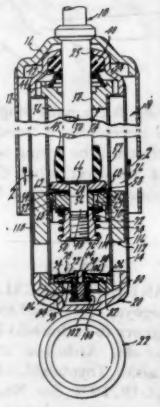
A power absorber combining the properties of a fluid filled dashpot with those of a rotating disk in fluid as employed in water brakes is disclosed. The power absorber provides absorption through the use of a rotating rotor which is moved linearly through the fluid medium.

3,722,639

SHOCK ABSORBER INCLUDING NOISE REDUCING MEANS

Johan H. Keijzer, Hasselt; Francois J. G. Meuleman, Bettincourt, Waremme; Louis J. Jossa, and Jozef J. Stas, both of St. Truiden, all of Belgium, assignors to Monroe Belgium N.V., Truiden, Belgium

Filed March 3, 1971, Ser. No. 120,558
Int. Cl. F16f 9/32
U.S. Cl. 188—315 **2 Claims**



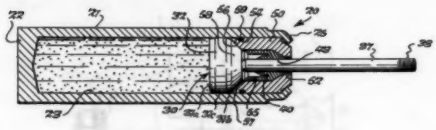
A generally ring-shaped member adapted to be installed within the fluid reservoir of a hydraulic direct-acting telescopic shock absorber for damping mechanical vibrations and/or controlling the flow of hydraulic fluid during operation of the shock absorber and thereby reducing the noise produced during operation of the shock absorber.

3,722,640

FLUID AMPLIFIED LIQUID SPRING SHOCK ABSORBERS WITH IMPROVED PISTON HEADS

Paul H. Taylor, 3877 E. River Rd., Grand Island, N.Y.

Filed March 26, 1971, Ser. No. 128,266
Int. Cl. F16f 9/19
U.S. Cl. 188—316 7 Claims



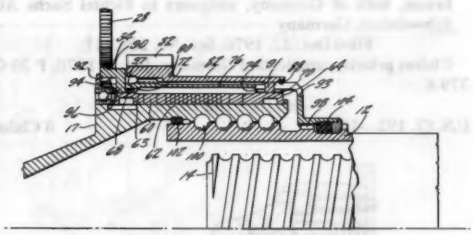
A highly efficient, low cost liquid spring shock absorber capable of fluid amplification and the generation of square energy waves and having a uniquely shaped piston head is provided for use in vehicle bumpers, automotive shock absorption systems and the like.

3,722,641

NO-BACK ACTUATOR SYSTEM

Edward H. Kusiak, Longmeadow, Mass., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 16, 1971, Ser. No. 181,128
Int. Cl. F16d 67/04
U.S. Cl. 192—8 C 6 Claims



A bidirectional no-back such as a sprag clutch or no-back spring for locking the rotary member of a screw type actuator for restraining its movement in either direction is loaded out of engagement to permit movement of the actuator by a pair of hydraulic motors cooperating therewith such that when one drives the other is driven.

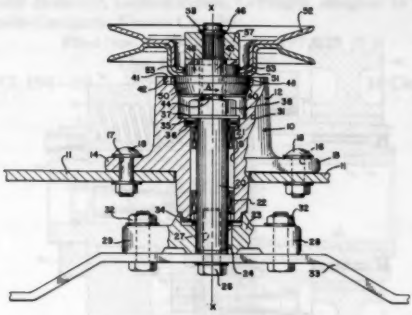
3,722,642

SELF-ACTUATED MECHANISM FOR BRAKING A DRIVEN MEMBER UPON DISCONTINUATION OF DRIVE THERETO

James W. Zurek, Lombard, and David A. Fulghum, La Grange, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed April 13, 1971, Ser. No. 133,641
Int. Cl. F16d 67/00
U.S. Cl. 192—8 R 13 Claims

A mechanism adaptable for connection between a drive and rotatable shaft to provide a driving connecting therebetween when mechanical power flows from the drive to the shaft, the mechanism being operable to produce a self-actuating braking force on the shaft when the power flow is interrupted thereby preventing extended free-wheeling of the shaft.

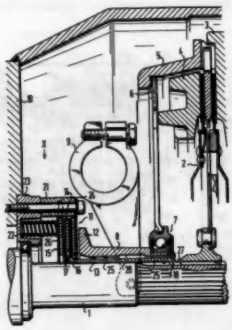


3,722,643

VEHICLE CLUTCH WITH GEAR SYNCHRONIZING BRAKE

Reiner Kempf, 8702 Hettstadt, and Hans-Walter Riese, 8721 Dittelbrunn, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed Sept. 30, 1971, Ser. No. 185,069
Claims priority, application Germany, Oct. 9, 1970, P 20 49 557.2
Int. Cl. F16d 67/02
U.S. Cl. 192—13 R 11 Claims



The clutch release mechanism of a friction clutch for a truck or like heavy-duty automotive vehicle is linked with a brake which quickly slows the clutch shaft when the clutch is released to permit prompt shifting of the associated gear transmission. Continued rapid rotation of the shaft after axial disengagement of the driven disc from the pressure plate may otherwise result from the inertia of the relatively heavy driven disc or from the viscosity of the cooling oil often employed in such heavy-duty clutches, particularly while the oil is still cold.

3,722,644

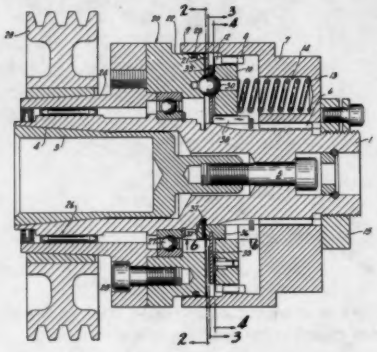
TORQUE LIMITING COUPLING

Horst G. Steinhagen, Racine, Wis., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Jan. 31, 1972, Ser. No. 221,935
Int. Cl. F16d 43/20
U.S. Cl. 192—56 R 8 Claims

A torque limiting coupling having a driving member and a driven member and which limits the amount of torque transmitted between the members. When excessive torque is at-

tempted to be transmitted, the coupling is released and overruns freely until the coupling is reset by causing reversal of its relative direction of rotation. The coupling utilizes a plurality



of balls which act between pockets in the two opposing members, thereby causing axial separation and release of the coupling when one of the members rotationally moves relative to the other.

3,722,645

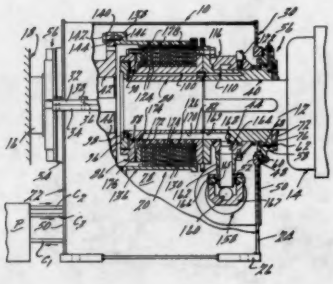
CLUTCH UNIT

Gordon M. Sommer, Grosse Pointe Woods, Mich., assignor to G. M. Sommer Co., Inc., Detroit, Mich.

Filed April 5, 1971, Ser. No. 130,947

Int. Cl. F16d *13/52, 13/72, 13/74*

U.S. Cl. 192—70.13 **32 Claims**



A clutch unit for selectively drivingly connecting a pair of generally coaxially aligned, axially spaced shafts, the unit comprising an enclosure having spaced side portions through which the shafts project, a pair of generally cylindrically shaped hub elements fixedly secured one to each of the shafts, a clutch assembly adapted to be operatively mounted between the hub elements for selectively drivingly connecting the same; the clutch assembly comprising a generally cylindrically shaped clutch hub, first attachment means securing the clutch hub to a driven ring spaced radially outwardly from clutch hub and arranged generally concentrically thereof, a plurality of torque transmitting discs extending radially between the outer periphery of the clutch hub and the inner periphery of the driven ring, with some of the discs being non-rotatably secured to the clutch hub and other of the discs being non-rotatably secured to the driven ring, an actuating member carried on the clutch hub for biasing the discs into driving relation, and means for axially shifting the driven ring whereby to permit removal of the clutch assembly without requiring movement of the hub elements or the shafts.

3,722,646

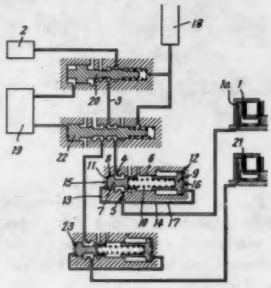
APPARATUS FOR CONTROLLING THE PRESSURE OF A FLUID FED TO A CLUTCH OF A TRANSMISSION

Tomio Oguma, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 807,779, March 13, 1969, abandoned. This application March 12, 1971, Ser. No. 123,914

Int. Cl. F16d *25/10*

U.S. Cl. 192—109 F **2 Claims**



A valve is interposed between a source of pressure fluid and a clutch of a transmission such that the valve initially passes the pressure fluid at a high rate to take up slack in the clutch whereafter the supply of pressure fluid to the clutch is sharply reduced during clutch engagement and subsequently gradually increased. The valve includes first and second chambers which are respectively fed with the pressure fluid being supplied to the clutch, one of the chambers being fed with delay.

3,722,647

WET-TYPE FRICTION CLUTCH

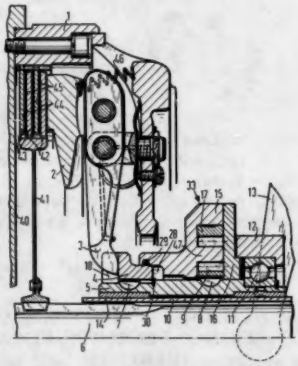
Helmut Kraus, Schweinfurt, and Hans-Walter Riese, Dittelbrunn, both of Germany, assignors to Fichtel Sachs AG, Schweinfurt, Germany

Filed Dec. 22, 1970, Ser. No. 100,711

Claims priority, application Germany, Jan. 7, 1970, P 20 00 379.6

Int. Cl. F16d *13/74*

U.S. Cl. 192—113 B **8 Claims**

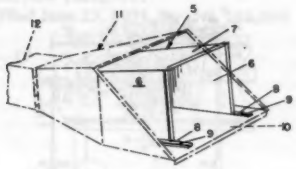


The friction facings in an automotive friction clutch of the wet type are supplied with liquid lubricant by a gear pump mounted on the clutch release bearing in such a manner that the stator of the pump is secured against rotation by the clutch release fork while the pump rotor is connected with the release levers on the clutch casing for joint rotation whenever the associated engine is operated.

3,722,648
AUXILIARY CHIPPER CHUTE

Norman E. Parker, 1343 Scott Street, and Ernest D. Siravo, 215 Clinton St., both of Maumee, Ohio

Filed Jan. 25, 1972, Ser. No. 220,573
Int. Cl. B65g 11/00, 11/18
U.S. Cl. 193—1 3 Claims

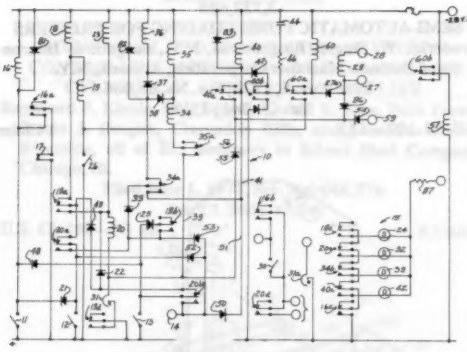


This invention consists of a chute that is fabricated from sheet steel or the like and which has a top and a side configuration of a trapezium, and an end configuration of an inverted letter U having square corners. The invention, which has open ends and no bottom, is placed inside of the chute of a chipper. The aforesaid invention is provided with drift pins for its securement in the already-mentioned chute of a chipper.

3,722,649
COIN ACCUMULATOR CIRCUIT AND APPARATUS

Robert L. Pfitzer, and Russell J. Drakes, both of Tonawanda, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Filed Sept. 23, 1971, Ser. No. 183,033
Int. Cl. G07f 5/10
U.S. Cl. 194—9 10 Claims

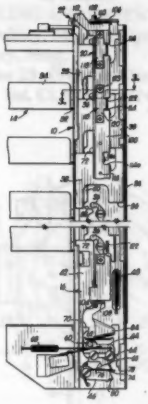


A coin accumulator circuit and apparatus is provided with electromagnetic relays arranged to be energized sequentially in such order as to accumulate credits up to and including a maximum amount corresponding to value of a bill credit. Insertion of a coin will produce a first number of credits while subsequent insertion of coins will produce a different number of unit credits until accumulation to a maximum amount of one dollar is reached and no further accumulation can take place. Credits per coin can be two credits for 25 cents, five credits for 50 cents, eight credits for 75 cents and 12 credits for 1 dollar, the 1 dollar value being accumulated in any order of coins, i.e. either 25-cent coins or 50-cent coins or a single bill.

3,722,650
DUAL PRICE SELECTIVE BOTTLED BEVERAGE VENDING APPARATUS

Wilhelm Buescher, Gelsenkirchen, Germany, assignor to The Vendo-Company, Kansas City, Mo.

Filed Nov. 9, 1971, Ser. No. 197,027
Int. Cl. G07f 11/30
U.S. Cl. 194—10 10 Claims

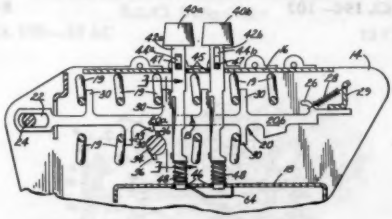


A dual-price, selective, vending machine, having a reciprocal captive mechanism for preventing access to articles at any of the vending stations of the machine until insertion of coins of predetermined value, is provided with additional structure for preventing vending operation at selected ones of the vending stations which carry higher priced articles until appropriate additional coinage has been deposited.

3,722,651
KEYBOARD

Michel Bass, North Plainfield, N.J., and Richard W. Pitman, Lafayette Hill, Pa., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed April 23, 1971, Ser. No. 136,931
Int. Cl. B41j 23/02
U.S. Cl. 197—16 5 Claims



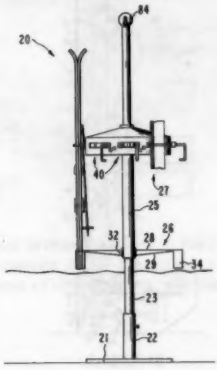
A keyboard having a plurality of interposers each pivotally movable on a first path of travel between a neutral and an actuated position. In the actuated position a drive dog will drive each interposer rectilinearly to cause switch action and a return spring urges the return after the switching. Each of the interposers is operable by a key which will move the interposer from its neutral to actuated position upon depression. Each key is provided with a leaf spring which is so mounted that it will drive the interposer when it is depressed, but will yield against the return movement of the interposer on its return movement to allow the interposer to return to its neutral position even though the key is held depressed.

Also a second set of keys may be provided which are movable to a second depressed position in which the leaf spring keeps the interposer depressed for repeat operation.

3,722,652
STORAGE AND LOCKING ASSEMBLY FOR SKIS AND POLES

Paul F. Busch, Portola Valley, and John F. Krumme, Woodside, both of Calif., assignors to Ski Valet, Inc., Portola Valley, Calif.

Filed Oct. 7, 1970, Ser. No. 78,792
Int. Cl. A47f 7/00
U.S. Cl. 194—64 15 Claims

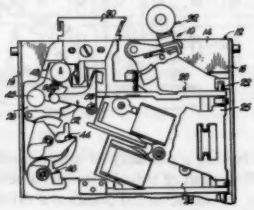


A circular ski rack is disclosed which can be adjustably positioned vertically for different snow depths. A simple foolproof locking assembly is provided for clamping and locking skis to the rack.

3,722,653
COIN HANDLING APPARATUS

John A. Hennessy, Raytown, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Oct. 19, 1971, Ser. No. 190,624
Int. Cl. G07f 3/02
U.S. Cl. 194—102 8 Claims

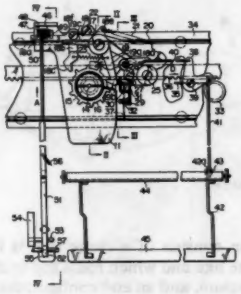


An auxiliary latch for a testing cradle of a coin-testing and accepting device is provided and arranged to be released by coins of the denomination to be tested by that cradle but to be non-responsive to coins of smaller diameter, even when the latter contact the cradle at considerable velocity or at an unusual angle, for assuring that coins of such smaller diameter will pass through the cradle without entering the accept path associated with the latter.

3,722,654
REPEAT SPACING MECHANISM FOR TYPEWRITERS

Tomoyoshi Watanabe, Minato-ku, Nagoya, and Masao Jozuka, Hekikaigun, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Mizuho-ku, Nagoya-shi, Japan

Filed Oct. 23, 1970, Ser. No. 83,589
Claims priority, application Japan, Oct. 24, 1969, 44/101043
Int. Cl. B41j 19/00
U.S. Cl. 197—82 7 Claims

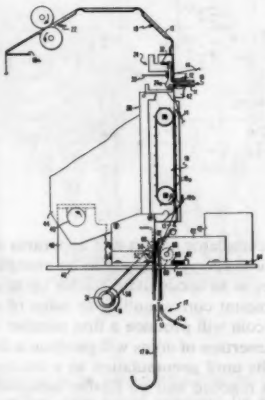


A repeat spacing mechanism for typewriters wherein there are rotatably mounted a feed pawl and a hold pawl on a pawl shaft coaxially therewith; normally the hold pawl engages a toothed wheel rotatably urged by a spring drum for moving a carriage in the letter feed direction. Further provided is an elastic member made of piano wire which is operated by a repeat space key, said member being provided with a weight at its free end. During depression of the repeat space key, the elastic member acts on the feed pawl, thereby causing the feed and hold pawls to be alternately engaged with and disengaged from the toothed wheel and the carriage to perform a continuous repeat spacing movement in the letter feed direction at a speed controlled by said weight.

3,722,655
SEMI-AUTOMATIC FORM LOADING FOR PRINTERS

Frederick W. Singer, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,006
Int. Cl. B41j 15/00
U.S. Cl. 197—133 1 Claim



Loading of a continuous form in a printer is facilitated by means of an auxiliary feed which is activated when the printer mechanism is moved to a non-printing position for loading.

ERRATUM

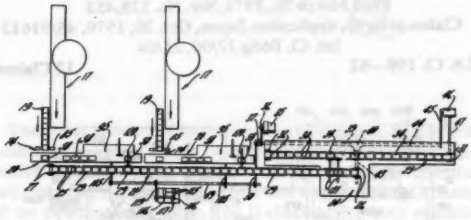
For Class 197—16 see:
Patent No. 3,722,651

3,722,656

SYSTEM FOR HANDLING AND ACCUMULATING ARTICLES

Clifford R. Loomis, Jr., both of Beloit, Wis.; Jerald R. Wiles, and Russel A. Newton, Rockford, Ill., assignors to Rexham Corporation, New York, N.Y.

Filed June 23, 1971, Ser. No. 156,004
Int. Cl. B65g *17/32*
U.S. Cl. 198—19 **7 Claims**



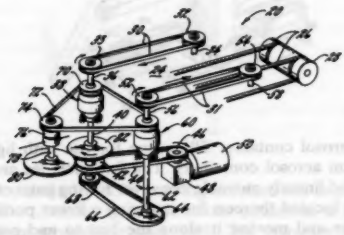
The system includes demand conveyors each having buckets for receiving packages from an automatic packager, the buckets being moved by the demand conveyor as required by the output of the packager. After the buckets have been loaded with packages, control of the buckets is switched to a timing conveyor that advances the buckets at a speed and pitch which match the speed and pitch of buckets on a continuously moving accumulating conveyor operable to receive the packages and to move the packages alongside a continuously moving conveyor carrying cartons into which the packages are inserted by an automatic cartoner.

3,722,657

ROTATIONAL AND TRANSLATIONAL MOTION CONTROLLING METHODS AND APPARATUS FOR CYLINDRICAL ARTICLES AND THE LIKE

Raymond P. Kienle, Oak Forest; Gerald R. Bass, Park Forest; James J. Deegan, Clarendon Hills, and Johannes Kiwiet, Riverside, all of Ill., assignors to Inland Steel Company, Chicago, Ill.

Filed June 1, 1971, Ser. No. 148,776
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AB **8 Claims**



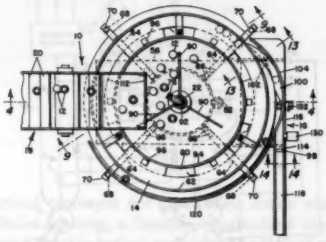
Methods and apparatus for selectively controlling rotational and translational handling and positioning of generally cylindrical objects such as containers for mass production line applications. In the case of handling a container for performing a coating operation or the like thereon, it is subjected to sequential transport and rotational modes. In the case of orientation handling, provision is made for torsionally rolling a container to arrive at a desired angular position, detecting the arrival of the container at the oriented position and longitudinally shifting the container in its fixed oriented position. Any two or more modes may be simultaneously performed with the present methods and apparatus.

3,722,658

CLOSURE HANDLING AND ORIENTING APPARATUS

Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed June 23, 1971, Ser. No. 155,751
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AA **19 Claims**



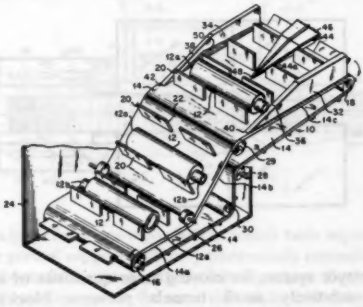
Apparatus particularly adapted for handling spherical closures having a flat portion at its open end wherein the randomly arranged closures are first manipulated to cause them to assume an oriented open end down position on a rotary disk whereupon the closures are aligned and discharged from the disk into a delivery chute. Provision is also made for preventing entrance into the chute of those closures in the line which inadvertently assume an open end up position and for rejecting such closures to be returned to the disk.

3,722,659

APPARATUS FOR ORIENTING AND FEEDING BOTTLES, OR LIKE ARTICLES

Samuel S. Aidlin; Stephen H. Aidlin, both of Brooklyn, and David Rich, Merrick, all of N.Y., assignors to Aidlin Automation, Inc., Brooklyn, N.Y.

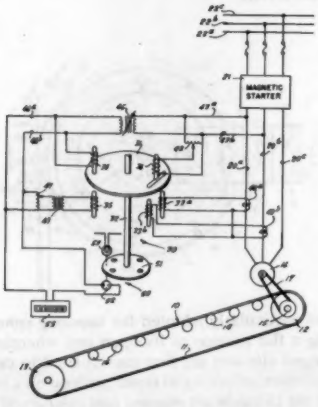
Filed Oct. 7, 1971, Ser. No. 187,330
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 AC **12 Claims**



Apparatus for orienting and feeding bottles, or like articles having necks at one end, in which the bottles are haphazardly picked up from the bin by spaced pairs of spaced alined cleats on an endless conveyor belt whose upper portion is horizontally disposed with means provided along such upper portion to engage the center of the bottle length to gradually elevate

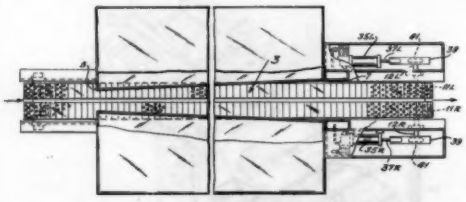
each bottle and tilt it into upright position to rest on its base to either side of the elevating means. Means are provided for translating the uprighted bottles on either side of the elevating means to a conveyor that is level with the outlet end of the bottle elevating and uprighting means.

3,722,660
WEIGHING APPARATUS
Edwin Des Snead, P.O Box 798, Georgetown, Tex.
Filed Nov. 26, 1971, Ser. No. 202,354
Int. Cl. B65g *69/00*
U.S. Cl. 198—39 **10 Claims**



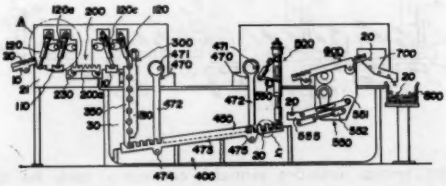
An inclined conveyor belt for lifting bulk material is driven by a three phase electric motor. A watt-hour meter connected in the motor circuit measures the gross power required and compensates for the power required to drive the empty conveyor, with the meter having an output proportional to the net power used for the actual load. The meter drives a counter summing the weight of the load actually lifted.

3,722,661
ARTICLE CONVEYOR SYSTEM
Ralph L. Williams, 3609 Manhattan, Maplewood, Mo.
Filed May 19, 1971, Ser. No. 144,758
Int. Cl. B65g *37/00*
U.S. Cl. 198—76 **16 Claims**



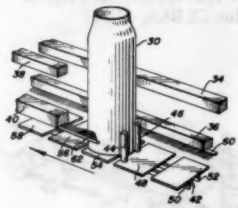
A conveyor system for moving large quantities of articles through relatively small tunnels prevents blocking of restricted passages or tunnels by the articles by including a pair of belts in side-by-side relation with each other, and intermittently halting the belts individually during their movement, with one belt continuing to move while the other is halted. Preferably the tunnel sides taper slightly outwardly from the inlet portal to the outlet portal which is correspondingly wider than the inlet portal, and the upper article-supporting surface of the belts are roughened to enhance frictional engagement with the supported articles. The belts may consist of short molded sections each having an integral sprocket chain link formed on its underside and pinned to the link part of the adjacent sections. For use in electrical treating apparatus, the belt sections are of dielectric material and may be perforated extensively. The belts are driven by a pneumatic cylinder and piston assembly through a one-way clutch so that if either belt becomes jammed, it can fully stop during the power stroke of its piston, and will be free to move rearwardly to relieve the jam during the reverse stroke of its piston.

3,722,662
SUCCESSIVE TRANSFER APPARATUS FOR SURFACE TREATMENT OF ELONGATE ARTICLES
Ikuzo Wakabayashi, and Tsutomu Sasaki, both of Yokohama, Japan, assignors to Nippon Kakon Kabushiki Kaisha
Filed March 26, 1971, Ser. No. 128,452
Claims priority, application Japan, Oct. 20, 1970, 45/91613
Int. Cl. B65g *37/00, 25/04*
U.S. Cl. 198—82 **12 Claims**



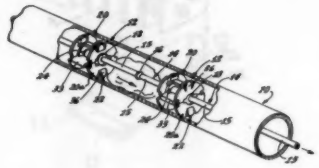
A transfer apparatus for the successive transfer through a plating bath or a coating tank of a plurality of small elongate articles, comprising a plurality component units adapted for the automatic branching and transfer of the articles into, through and from the plating bath or coating tank, and so mechanically coordinated that the plating or coating operation can be performed automatically and without interruption of operation.

3,722,663
STABILIZING APPARATUS FOR LIGHTWEIGHT CONTAINERS
John C. Nalbach, La Grange Park, Ill., assignor to John R. Nalbach Engineering Company, Inc., Chicago, Ill.
Filed June 14, 1971, Ser. No. 152,672
Int. Cl. B65g *15/58, 17/06*
U.S. Cl. 198—160 **4 Claims**



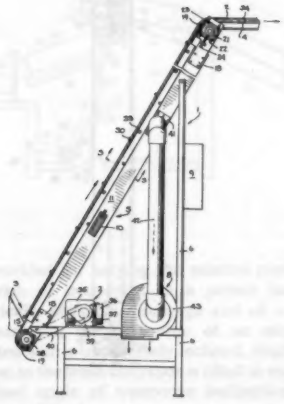
An aerosol container filling line for use with light-weight aluminum aerosol containers. The line includes an intermittently and linearly movable conveyor having pairs of upstanding pins located thereon for engaging a lower portion of the container and moving it along the line to and past various operating stations. A pair of longitudinally extending brushes are mounted to the production line on both sides of the conveyor and are adapted and arranged to engage the sides of the container at a position between the conveyor surface and the top of the pins so as to prevent the container from toppling rearwardly as the line begins to move from its stopped position.

3,722,664
ARTICULATED PUSHER CONVEYOR CHAIN
Harold W. Hart, and Edward A. Southworth, both of Glendale, Calif., assignors to H. W. Hart Mfg. Co., Glendale, Calif.
Filed April 30, 1971, Ser. No. 138,893
Int. Cl. B65g *19/00*
U.S. Cl. 198—168 19 Claims



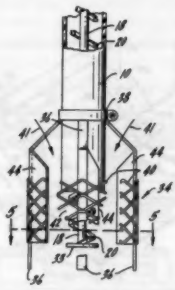
The chain consists of pushers interconnected by links, each pusher comprising a pair of spaced coaxial disks interconnected both by spaced webs and spaced U-shaped clips, the two disks confining socket washers that engage enlarged heads of the corresponding links. The U-shaped clips both straddle and space apart the two disks and the U-shaped clips as well as the two webs space apart the two socket washers and at the same time cooperate with the two disks to captivate the two washers.

3,722,665
VACUUM ELEVATING CONVEYOR
Charles W. Probasco, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Filed March 31, 1971, Ser. No. 129,784
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 1 Claim



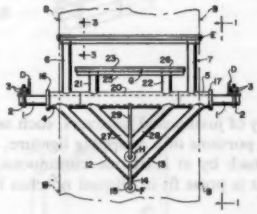
A conveyor is disclosed for moving articles such as closure caps and other articles in a continuous stream to a higher elevation along a relatively steep path. The conveyor has an endless belt with an air permeable surface. An inclined article transporting run of the belt passes over and communicates with a vacuum box whereby articles fed onto the bottom of the moving belt are held on the belt by a vacuum force as they are carried upwardly to the elevated discharge point. A control is included in the vacuum forming box to automatically regulate the vacuum force on the articles in accordance with the number of articles held on the moving belt.

3,722,666
TUBULAR CONVEYOR
Erwin H. Ulm, Westchester, Ill., and Robert June, II, Birmingham, Mich., assignors to Triskelion Corp., Franklin Park, Ill.
Filed Dec. 22, 1969, Ser. No. 887,006
Int. Cl. B65g *33/00*; G01f *11/20*
U.S. Cl. 198—213 7 Claims



An improved conveyor for particulate solids which comprises a tubular housing, a flexible, longitudinal central core member, and a flexible helical member. The helical member is positioned around the core member, and is in spaced relationship with the core member and the housing. Drive means are provided for rotating both the core member and the helical member in the same direction and at the same rotational speed. In one embodiment the invention also provides a conveyor housing a vertical intake guide assembly on one end, the guide assembly being particularly adapted to conveying granular materials from a drum or other container.

3,722,667
DUAL WIPING DEVICE FOR A CONVEYOR BELT IN WHICH BOTH WIPERS HAVE A COMMON PIVOTAL SUPPORT BUT OPERATE INDEPENDENTLY OF EACH OTHER
Laddie B. Olson, 24960 Townsend Avenue, Hayward, Calif.
Filed June 14, 1971, Ser. No. 152,673
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 5 Claims



Dual wipers for a conveyor belt in which both wipers have the same pivotal support and carry transversely extending wiping members with respect to the belt being wiped. Both wiping members are disposed on the same side of the common pivotal support and each has an independent adjustable weight or spring disposed on the other side of the pivotal support that yieldingly holds its wiping member in contact with the belt and independently of the other wiping member.

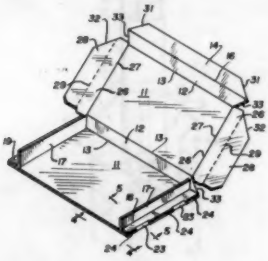
ERRATUM

For Class 198—313 see:
Patent No. 3,722,865

3,722,668
CUSHIONED SHIPPING FOLDER

John L. Carpenter, Anderson, Ind., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 22, 1972, Ser. No. 228,060
Int. Cl. B65d 85/30
U.S. Cl. 206—46 FR 3 Claims

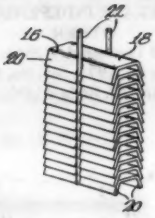


A cushioned shipping folder is characterized by a pair of end cells of triangular cross section resistant to deformation and protecting a flat article such as a book or the like held within the folder.

3,722,669
FASTENER STACK

William A. Meier, Hoffman Estates, and Edward P. Wojcik, Niles, both of Ill., assignors to Signode Corporation

Filed March 19, 1971, Ser. No. 125,999
Int. Cl. B65d 71/00, 83/00
U.S. Cl. 206—56 K 5 Claims



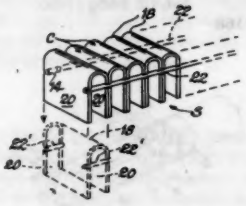
A plurality of juxtaposed fasteners, such as seals for joining overlapping portions of a strapping ligature, are retained in a semi-rigid stack by at least one continuous, flexible, plastic filament that is press fit in aligned notches in the legs of the fasteners.

3,722,670
CLIP STACK

Larry D. Plunkett, Crystal Lake, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed March 19, 1971, Ser. No. 126,018
Int. Cl. B65d 71/00; F16l 21/00
U.S. Cl. 206—56 AC 7 Claims

A clip stack, a method of forming a rigidified joint, and the resulting joint. Filler material is positioned adjacent wires to be clinched by a clip, and is clinched with the wires to deform and to be compressed by the clip and wires to form a stronger and more rigid joint. The filler material may be carried by the clip, and may be severed from a clip stack joined by a strand of filler material from which filler material is severed as a clip is



separated from the stack. The filler material may be at both sides of the stack and in an interference fit in notches in opposite sides of the clips of the stack.

3,722,671
SANDWICH PANEL INSERT AND INSTALLATION HOLDER ASSEMBLY AND METHOD OF HANDLING

George H. Wright, Orange, and Charles S. Phelan, Tustin, both of Calif., assignors to Shur-Lok Corporation, Santa Ana, Calif.

Filed Sept. 21, 1970, Ser. No. 73,813
Int. Cl. B65d 75/06, 85/62
U.S. Cl. 206—65 K 4 Claims

A column of sandwich panel inserts each attached to a respective holding tab by a coating of adhesive subsequently operative to attach the tab and insert to a sandwich panel. The insert and tab units are held in coaxial assembly by a wire stringer of hairpin form having respective legs received in peripheral notches in the radial flange heads of the insert, which notches are utilized for injection of potting compound into a hole in a sandwich panel in which the insert is positioned by the tab. The column of inserts and tabs is enclosed in a dust-proof casing having an opener thread for slitting its side for removal of the insert-tab units.

3,722,672

SLIDE FASTENER DEVICE

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Choyoda-ku, Tokyo, Japan

Filed May 17, 1972, Ser. No. 254,170
Claims priority, application Japan, May 20, 1971, 46/40752
Int. Cl. B63d 73/00; A44b 19/36
U.S. Cl. 206—79 3 Claims

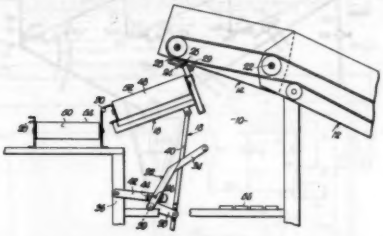
A slide fastener device comprising a tag removably attached on an end of the fastener, part of said tag being utilized to function as an end stop for limiting thereat the reciprocal movement of a sliding member.

3,722,673

STRUCTURE FOR VARYING RELATIVE POSITIONS OF CONVEYORS

Thomas Albert Bedwell, Logan, Utah, and Bobby Dwayne McWhirt, Hesston, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Jan. 11, 1972, Ser. No. 217,026
Int. Cl. B07c 9/00
U.S. Cl. 209—73 13 Claims



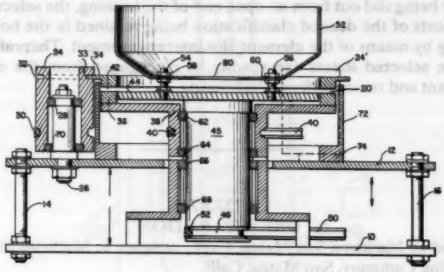
Structure is provided for varying the relative positions of certain of a series of conveyors in a potato harvesting machine. A vertically shiftable discharge end of a potato-receiving side conveyor in the nature of an elevator is operably connected with a transversely inclined, tiltable trash conveyor such that as the trash conveyor is tilted to maintain it at a predetermined angle of transverse inclination during ascent and descent of the harvester over uneven terrain the discharge end of the elevator is automatically raised and lowered. The connection itself is of such nature that the extent of gravitation of the potatoes from the elevator to the trash conveyor is kept at a minimum at all angles of inclination of the trash conveyor to avoid bruising of the potatoes. Thus, the proper angle of inclination of the trash conveyor may be maintained so that the potatoes will separate from dirt, clods, rocks and vines picked up by the elevator without danger of damage as the potatoes drop onto the trash conveyor. A front, bulk loading conveyor, disposed to receive the potatoes as they roll laterally from the trash conveyor, serves as an articulated support for the trash conveyor.

3,722,674

APPARATUS FOR SORTING PARTICULATE ARTICLES

Kurt H. Hoppmann, and Horst A. Schober, both of Falls Church, Va., assignors to Hoppmann Corporation, Springfield, Va.

Continuation-in-part of Ser. No. 135,225, April 19, 1971, Pat. No. 3,669,260. This application June 12, 1972, Ser. No. 262,162
Int. Cl. B07c 5/00
U.S. Cl. 209—73 13 Claims



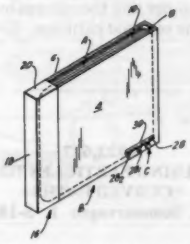
Apparatus for sorting, including feeding, orienting and counting, particulate articles such as coins, shells, candy, pills and the like, wherein the articles are placed upon a rotating inner plane and centrifugally discharged through a peripheral gauging aperture defined at the edges of a rotating inner plane. The peripheral aperture is defined by a pair of top and bottom outer gauging rings rotated at speeds similar to or at variance with the rotating inner plane according to the character of the articles being counted. Also, the size of the gauging aperture may be varied by vertical adjustment of the top outer ring to accommodate centrifugal discharge articles of varying dimension. The discharged articles may be guided tangentially and single file past a conventional photo electric or similar counting device. The rotating inner plane may have a horizontal surface, alternately a concave, convex or contour profile.

3,722,675

SORTING OF DIFFERENTLY CLASSIFIED SHEETS

Arnold M. Baskin, 26 Old Orchard Road, North Haven, Conn.

Filed June 23, 1971, Ser. No. 155,936
Int. Cl. B07c
U.S. Cl. 209—80.5 17 Claims



A group of sheets to be sorted into different classifications are provided on their lower edges with upwardly extending slots, the slots on each sheet being differently positioned relative to the front edge of that sheet depending upon the particular classification into which that sheet falls. The sheets are used in conjunction with a sorter housing into which all of the sheets are adapted to be received as a group, that housing

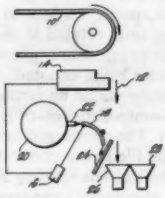
being provided with a series of apertures spaced upwardly from its lower edge and located at positions corresponding to the sheet slots for each sheet classification respectively. A sorting element is adapted to extend across the interior of the housing at the locations defined by those apertures. Those sheets not of the desired classification will be raised by that sorting element, whereas those sheets of the desired classification will assume a lower position in the housing, the sorting element being received in the slots formed in the lower portions of those sheets. Thereafter the unselected sheets can be removed from the housing either from above or, preferably, by being slid out from an open end of the housing, the selected sheets of the desired classification being retained in the housing by means of the element-slot interengagement. Thereafter the selected sheets can readily be disengaged from the element and removed from the housing.

3,722,676

ORE SEPARATION

Ted C. Mathews, San Mateo, Calif., assignor to Mathews Mining Company, San Mateo, Calif.

Filed Aug. 23, 1971, Ser. No. 173,776
Int. Cl. B07c *5/34*
U.S. Cl. 209—74 **10 Claims**



There is disclosed herein an apparatus for detecting and separating a desired ore or mineral from a quantity of ore. The apparatus includes a plurality of selectively deflectable flowing fluid streams. The streams are controlled to displace the desired mineral particles from the quantity of ore. Pivotally mounted arcuate tubes normally divert the fluid streams when then are not acting to displace particles, but these tubes are selectively movable to allow the streams to hit desired particles. A screen is used for conveying the ore past the fluid streams in such a manner that the streams may act through the screen to displace the selected particles.

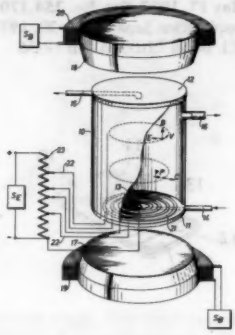
3,722,677

DEVICE FOR CAUSING PARTICLES TO MOVE ALONG CURVED PATHS

Bo Peter Lehnert, Sommarvagen 1, S-182 74 Stocksund, Sweden

Filed June 3, 1971, Ser. No. 149,732
Claims priority, application Sweden, June 4, 1970, 7788/70
Int. Cl. B04c *3/06*
U.S. Cl. 209—144 **6 Claims**

A cylindrical vessel confines a volume therein, the cylindrical vessel being subjected to an axial magnetic field, and a radial electrical field. In order to provide for laminar flow of particles introduced into the vessel and removed therefrom, electrodes establishing the electrical field are formed as rings located at the end surfaces of the cylindrical vessel, and connected to tap points on a voltage divider, to establish an elec-



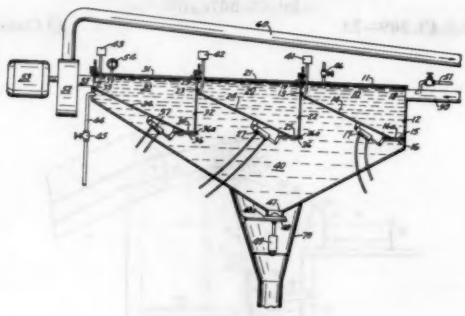
trical gradient which is substantially parallel to planes passing through the curved paths of movement of the particles.

3,722,678

MINERAL CONCENTRATOR AND METHOD OF CONCENTRATING

Edwin C. Potter, Brooklyn Park, Minn., assignor to Marine Science Industries, Inc., Minneapolis, Minn.

Filed June 8, 1971, Ser. No. 150,995
Int. Cl. B03b *3/30*
U.S. Cl. 209—156 **10 Claims**



Relatively heavy mineral or metal is rapidly and efficiently separated from lighter particulate material with which it is mixed. An aqueous slurry of the mixture is drawn through a series of hutches, the bottoms of consecutive hutches being disposed in ascending sawtooth arrangement. The heavier mineral settles to the bottom of the hutch, where an openable and closable discharge port is located, while the lighter material is carried to the next hutch. By connecting a surge tank to the bottom of the hutches and filling the entire unit with water, the hutches can be discharged without disrupting the separation process.

3,722,679

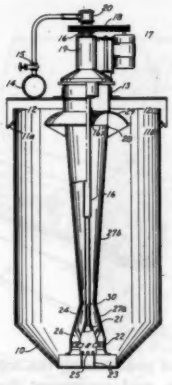
METHOD AND MEANS FOR FROTH FLOTATION CONCENTRATION UTILIZING AN AERATOR HAVING A VENTURI PASSAGE

Leland H. Logue, 150 South Marion Parkway, Denver, Colo.

Filed Sept. 24, 1970, Ser. No. 74,998
Int. Cl. B01f *3/04*
U.S. Cl. 209—164 **14 Claims**

Method and means concepts are disclosed for concentration of minerals and the like by froth flotation treatment in a

cell utilizing a venturi tube aerator in a submerged upright position having a shorter flaring portion of a wider angle at its intake end and a longer portion of lesser angle at its upper discharge end with induced flow from intake to discharge causing dissolution of gas in the pulp flow through the intake



portion and precipitation of dissolved gas on reagent coated mineral of the pulp flow through the discharge portion. Aerated pulp discharge from aerator onto pulp surface shielded to prevent bubble breakage during direct surface travel to overflow.

3,722,680

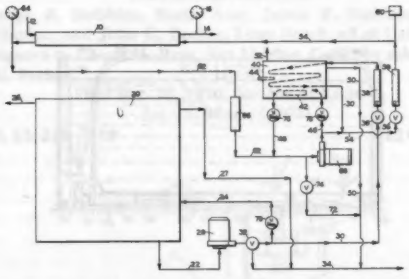
HEMODIALYSIS APPARATUS

Frank R. Smith, 3848 S. Pine Street, Tacoma, Wash.

Filed March 17, 1971, Ser. No. 125,110

Int. Cl. B01d *31/00*

U.S. Cl. 210—96 **11 Claims**



Dialysate delivery apparatus for use with a hemodialyzer provided with a dialysate inlet and a dialysate outlet comprises conduit means coupled to the inlet and outlet of the hemodialyzer as well as to a waste discharge. A fresh dialysate storage reservoir and a used dialysate recirculating reservoir communicate with the conduit means. A fresh dialysate pump is arranged in the conduit means for withdrawing fresh dialysate from the storage reservoir and circulating it to the inlet of the hemodialyzer. A used dialysate pump is arranged in the conduit means for drawing used dialysate from the hemodialyzer and circulating it to the recirculating reservoir. The conduit means also includes valve means which functions to combine a predetermined proportion of the used dialysate with the fresh dialysate being circulated to the inlet of the hemodialyzer, and to circulate a predetermined proportion of the used dialysate to and from the dialyzer as well as to the waste discharge. In this manner maximum economy of dialysate and maximum efficiency of operation of the hemodialyzer are achieved.

3,722,681

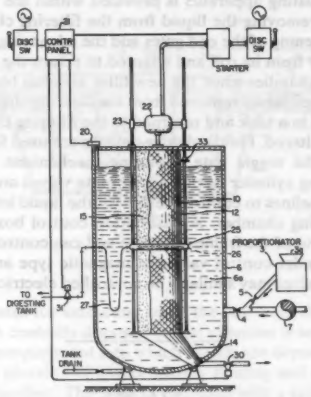
TERTIARY FILTERING ARRANGEMENT

Salem Boorujy, 22 Carmine St., Chatham, N.J.

Division of Ser. No. 855,626, Sept. 5, 1969, Pat. No. 3,574,098. This application Dec. 28, 1970, Ser. No. 102,104

Int. Cl. B01d *29/38*

U.S. Cl. 210—108 **1 Claim**



An apparatus for filtering liquids containing suspended solids is disclosed which includes a filter element and a scraper for cleaning the filter as the suspended solids collect on the surface thereof. The scraper is apertured to permit the collected debris to enter within the scraper and the inside of the scraper is connected to a ventable line. The pressure developed by the cleaned liquid on the inside of the filter suffices when the ventable connection is made to force the cleaned water back through the filter thereby flushing off the debris from the outside of the filter and causing it to enter the inside of the scraper and pass through the ventable line thereby cleaning the outside of the filter.

3,722,682

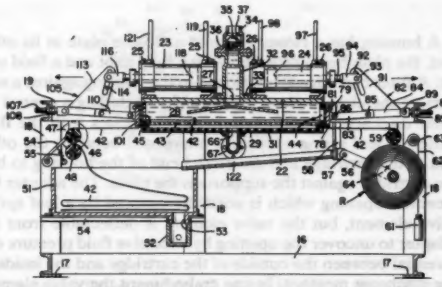
LIQUID FILTERING APPARATUS

Irving Pistiner, 1401 Jessup Ave., Bronx, N.Y.

Filed Aug. 11, 1971, Ser. No. 170,849

Int. Cl. B01d *29/02*

U.S. Cl. 210—123 **9 Claims**



A self contained liquid filtering apparatus has been provided. A filtering chamber is provided at the top of an elongated frame structure and this frame structure supports also toggle actuated devices for opening and closing end gates at the open ends of the filtering chamber in order to permit the advancing of a filtering sheet that is taken from a roll sup-

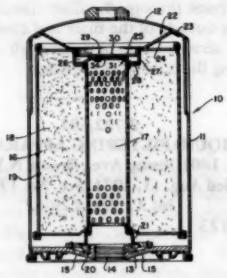
ported upon the frame and is drawn by a motorized roller through the end openings of the filtering chamber upon the end gates being lifted by toggle devices. The dirtied paper is drawn from the filtering chamber and disposed of in a tray lying within the frame structure of the apparatus arranged to receive drippings from one end opening of the filtering chamber and the drippings from the other end of the filtering chamber are delivered to the tray by an inclined drain plate. An evacuating apparatus is provided within the frame structure for removing the liquid from the filtering chamber prior to the opening of the end gates and the advancing of the filtering paper from its roll and adapted to return the liquid to the filtering chamber when the new filter area has been provided. The filtered liquid removed from the filtering chamber may be collected in a tank and returned to the filtering chamber so as to be refiltered. Fluid cylinder devices are used for the actuation of the toggle gate operating mechanisms and for the evacuating cylinder device appropriate valves are used in the liquid pipelines to control the flow of the liquid into and out of the filtering chamber. A pushbutton control box is mounted on one end of the frame structure and can control the various fluid cylinder control valves of magnetic type and the liquid control valves may similarly be controlled electrically.

3,722,683

FLUID FILTER DEVICE

Robert J. Shaltis, and David Woltjer, both of Hastings, Mich., assignors to Hasting Manufacturing Company, Hastings, Mich.

Filed Dec. 10, 1971, Ser. No. 206,713
Int. Cl. B01d *27/10*
U.S. Cl. 210—132 **20 Claims**



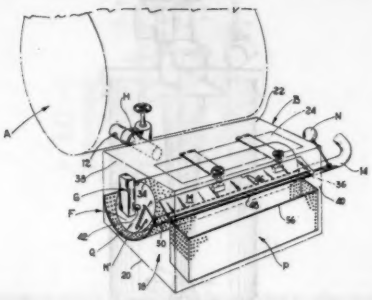
A housing has a closed end and a closure plate at its other end, the plate being provided with a fluid inlet and a fluid outlet. A filter cartridge is positioned in the housing against a support on the closure plate, the cartridge including a central tubular discharge member which communicates with the fluid outlet. A leaf spring adapter is interposed between the other end of the cartridge and the closed end of the housing to bias the cartridge against the support on the plate. The adapter has a central opening which is normally covered by a leaf spring valve element, but the valve element is deflectable from the adapter to uncover the opening by excessive fluid pressure differential between the outside of the cartridge and the inside of the discharge member. In one embodiment the valve element is imperforate and normally closes the opening in the adapter, becoming open when flow through the cartridge is blocked. In a second embodiment the valve element has an opening in register with that in the adapter and the opening in the valve element is covered by a screen which constitutes a secondary filtering medium additional to the primary filtering medium afforded by the cartridge. In the second embodiment the valve element becomes open when the screen is blocked.

3,722,684

EQUIPMENT FOR PRE-FILTERING THE SOLVENT, PARTICULARLY IN DRY-CLEANING MACHINES

Gino Maestrelli, 55 Via Bernardo Quaranta, Milan, Italy

Filed Oct. 20, 1970, Ser. No. 82,392
Int. Cl. B01d *33/06*
U.S. Cl. 210—167 **6 Claims**



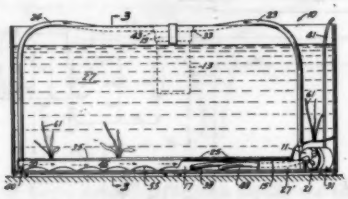
An equipment for pre-filtering the solvent in dry-cleaning machines or plants, said equipment comprising a chamber wherein drained dirty solvent is forced to pass across a filtering surface which is continuously cleaned by scraping means, relatively movable with respect to said filtering surface. Said filtering surface is in the form of an outer surface of a revolvingly fitted perforated drum; whereon a scraping blade is acting in order to remove any dirt therefrom and collect the same within a collecting box or the like.

3,722,685

AQUATIC FILTRATION SYSTEM

Henry E. Orensten, and Vivian C. Orensten, both of 2648 Inglewood Avenue, St. Louis Park, Minn.

Filed May 28, 1971, Ser. No. 147,856
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **5 Claims**



The disclosed aquatic life support system provides an apertured flow control plate which defines a lower chamber of an aquarium tank. A filtered water return and a water intake means are both located within this lower chamber. A pump draws contaminated water through the intake and drives the contaminated water through a filter. The output side of the filter is connected to the water return underneath the apertured plate.

3,722,686

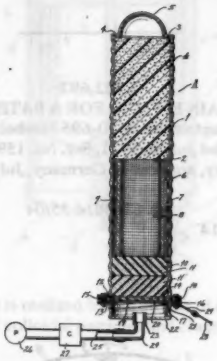
POND FILTER

Wayne E. Arnett, Hettick, and Cyril P. Solomon, Palmyra, both of Ill., assignors to Solarn Mfg. Co., Inc., Hettick, Ill.

Filed March 17, 1971, Ser. No. 125,101
Int. Cl. B01d *35/02*
U.S. Cl. 210—170 **8 Claims**

A pond filter comprising a cylindrical casing having a coarse filter in communication with the surrounding fluid through

openings in the side wall of said casing, a secondary or fine filter disposed adjacent said coarse filter and a relatively increased fine filter presented down-stream of said fine filter; there being pump means connected to said filter through an intervening collecting receptacle. One form of the present invention contemplates the incorporation of a volume of buoyant material within the casing upwardly of the coarse filter, while another embodiment obviates the provision of buoyant material through fixing the filter within the fluid body by rigid supports.

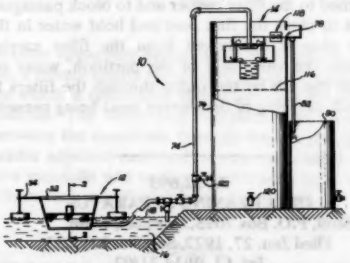


3,722,687

FLOATING OIL SKIMMING APPARATUS WITH OIL AND WATER SEPARATOR

George B. Stebbins, Santa Ana; James F. Stebbins, San Marino, and John G. Becker, Long Beach, all of Calif., assignors to Edessa H. Rose, San Marino, Calif., by said John G. Becker

Filed Dec. 28, 1970, Ser. No. 101,644
Int. Cl. B01d *19/00*
U.S. Cl. 210—219 12 Claims



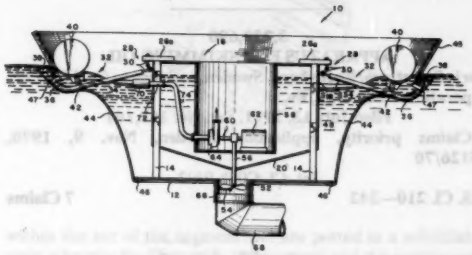
A floating platform, vertically adjustable relative to the surface of the water and an oil slick floating thereon, having a weir member at the outer periphery and a sump and centrifugal pump adjacent the center thereof, and an oil-water separator for receiving an aerated oil and water mixture from the pump and cascading it over vertically spaced pan-like separators for causing the air and oil in the mixture to float to the surface of the separator, and water to flow to the bottom.

3,722,688

SEA-SURFACE OIL EXTRACTOR

Robin F. Wirsching, Summerland Key, Fla., assignor to Reynolds Submarine Services Corporation, Miami, Fla.

Filed May 13, 1971, Ser. No. 142,940
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 7 Claims



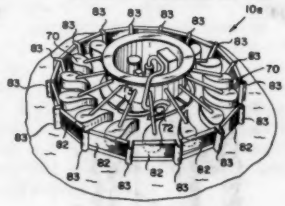
An apparatus for extracting oil or the like from the surface of the sea. A centrally disposed ballast chamber is surrounded by a sump compartment into which liquids are deposited over the lips of a plurality of independently floating and an articulated weir member. The latter is provided with a substantially universal connection to the ballast chamber. A flexible skirt member forms an external wall portion of the sump compartment and is connected to the lips of the weir member. In this manner a pressure differential across the skirt member is communicated to an individual segment of the weir member in order to vary the elevation of the weir member in a self-compensating manner. Means are provided to pump liquids out of a submerged exit port in the sump compartment and for imparting direction to these pumped liquids in order to provide controlled propulsion for the skimming apparatus.

3,722,689

APPARATUS FOR EXTRACTING OIL OR THE LIKE FROM THE SURFACE OF THE SEA

Arthur L. Markel, Miami, and Robin F. Wirsching, Summerland Key, both of Fla., assignors to Reynolds Submarine Services Corporation, Miami, Fla.

Filed May 13, 1971, Ser. No. 143,105
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 11 Claims



Apparatus for extracting oil or the like from the surface of the sea. A centrally disposed ballast chamber is surrounded by a sump compartment which is sufficiently large so as to obtain deceleration of flow of the liquids which pass over an articulated weir member. The latter is connected to arm members which are provided with a substantially universal connection to the ballast chamber. A flexible skirt member forms an exterior wall portion of the sump compartment and is connected to the lips which constitutes an upper edge of the outer weir

member. In this manner a pressure differential across the skirt member is communicated to an individual weir segment member in order to vary its elevation in a self-compensating manner. In a preferred form of the invention, the float members form vanes so arranged as to impart a vortex or circular swirl to the fluids passing over the outer weir. An inner weir means is used to collect oil floating on the surface within the sump which has accumulated adjacent the wall of the centrally disposed ballast chamber.

3,722,690

APPARATUS FOR SKIMMING OIL

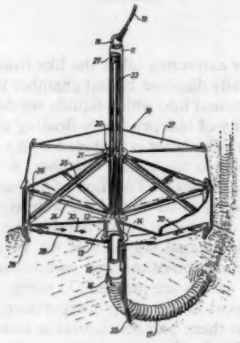
Borje Stenstrom, Enebyberg, Sweden, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed July 13, 1971, Ser. No. 162,161

Claims priority, application Sweden, Nov. 9, 1970, 15126/70

Int. Cl. C02b *9/02*

U.S. Cl. 210—242 **7 Claims**



A collapsible flotation buoy is disclosed for skimming an oil layer from water in a tanker. The buoy is provided with mechanical folding means for collapsing the buoy, permitting its insertion into a narrow opening at the top of the tank. The folding means is remotely controlled to permit expansion of the buoy for use when it is inside the tank.

3,722,691

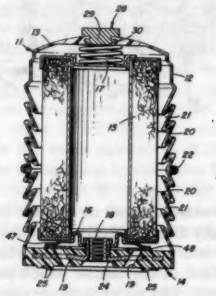
FILTER FOR REMOVING PARTICULATE CONTAMINANTS FROM FLUIDS

Paul L. Francois, 46 Northover Place, Red Bank, N.J.

Filed March 3, 1971, Ser. No. 120,668

Int. Cl. B01d *21/00, 27/00*

U.S. Cl. 210—304 **30 Claims**



A filter for removing particulate contaminants from fluids such as oil comprising a filter element in a generally cylindrical, thin walled plastic housing having a base threadably engaged to fluid inlet and outlet means, commonly known as a spin-on filter in which the housing is provided with fluid flow interruption means for enhancing the deposition and collection of particulate debris said means including internal, sharp angled convolutions, radial or helical, said means also including fluid inlet passages in the base oriented at an angle to the longitudinal axis of the housing.

3,722,692

DRAIN FITTING FOR A BATH TUB

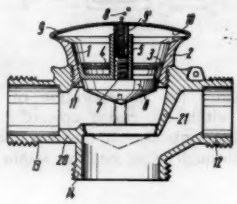
Kurt Baade, Hauptstrasse 26, D-695 Mosbach, Germany

Filed July 6, 1971, Ser. No. 159,677

Claims priority, application Germany, July 9, 1970, P 20 34 054.9

Int. Cl. B01d *35/04*

U.S. Cl. 210—314 **7 Claims**



A drain fitting for a bath tub or the like has four ports. The first port of the installed fitting leads into the bottom of the tub, a second port is connected with a pump that discharges water from the tub through a shower head, a third port is connected with the overflow of the tub, and a fourth port leads to the drain. A partition in the shell of the fitting is provided with a valve seat and separates the first and second ports from the third and fourth ports when the valve seat is sealed by a plug. A second valve seat in the first port may receive a filter carrier equipped with a coarse filter and a fine filter. The plug and the filter carrier are provided with threads which permit the plug to be attached to the filter carrier and to block passages in the same so as to close the first port and hold water in the tub. When the plug is unscrewed from the filter carrier and dropped into the valve seat of the partition, water may be drawn from the tub by the pump through the filters for the shower head, clogging of the shower head being prevented by the filters.

3,722,693

OIL CLEANING APPARATUS

Robert E. Stull, P.O. Box 7095, Prospect, Conn.

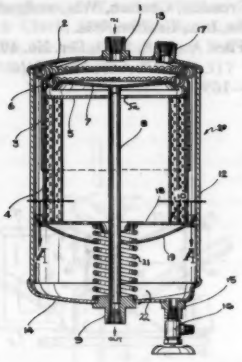
Filed Jan. 27, 1972, Ser. No. 221,233

Int. Cl. B01d *21/02*

U.S. Cl. 210—320 **6 Claims**

The oil cleaner herein disclosed, utilizes in a unique manner, known characteristics of physical, chemical and electrical forces, to act upon contaminant particles suspended in a fluid, typically a lubricating oil, as the fluid is forced under pressure therethrough. The cleaner includes special passages, which affect velocities, pressures and electrical properties of the oil. Attendant phenomena attributable to differential friction, eddy currents, gravity forces and the result of particle im-

pact on internal surfaces contribute to the cleaning action of the new device. Further cleaning efficiency of the disclosed oil



cleaning apparatus is realized by the effects of electrostatic attraction on ionized colloidal particles and chemical neutralization of acids.

3,722,694

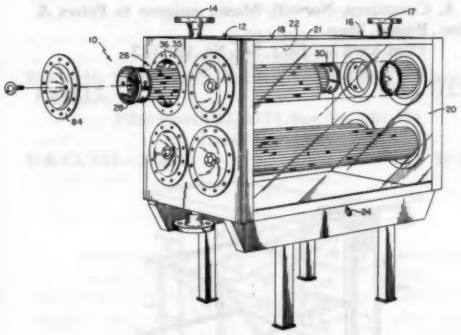
FILTRATION DEVICE

Edward A. Agranat, Weston, Mass., assignor to Romicon, Inc., Lexington, Mass.

Filed June 10, 1970, Ser. No. 45,115

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **12 Claims**



A filtration apparatus having an inlet manifold, an outlet manifold, a filtrate region therebetween, and at least one filter cartridge which is removable and replaceable through one of the manifolds. The removably mounted filter cartridge extends between the manifolds through the filtrate region, and has a header adjacent each end, in communication with each respective manifold and sealing the filtrate region of the apparatus from each manifold thereof, respectively.

3,722,695

ARTICLE FOR FABRICATING PERMEABLE HOLLOW FIBER SEPARATORY ELEMENT TUBE SHEETS AND SEPARATORY ELEMENTS PREPARED THEREFROM

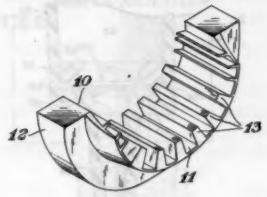
John A. Sargent, Berkeley, and Francis W. Straub, Pittsburg, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 19, 1971, Ser. No. 163,896

Int. Cl. B01d *31/00*

U.S. Cl. 210—321 **4 Claims**

An annular segment having projections which extend radially inward from the inner surface thereof provides numerous benefits and advantages in preparing separatory elements wherein end portions of hollow permeable fibers are disposed



within the arc of the segment and are potted in a solidifiable resin whereby the fiber ends, the segment and the potting resin form an integral tube sheet structure.

3,722,696

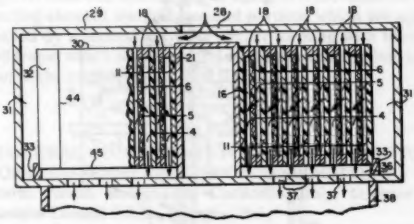
SPIRAL-WOUND FILTER

James L. Dwyer, Concord, and Peter A. Reiman, Weston, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed April 22, 1971, Ser. No. 136,315

Int. Cl. B01d *27/00*

U.S. Cl. 210—435 **13 Claims**



A filter unit formed by spirally winding a multi-layer material around a core to form a generally cylindrical construction having two opposing spiral end surfaces. The multilayer material used to make the filter unit has at least one filter layer, at least two generally flat spacer layers formed from a material with a high void volume and at least one fluid-impermeable layer. The layers are adhered along the lengthwise and widthwise edges so that, in use, unfiltered fluid supplied to the unit through one spiral end surface must pass through a filter layer before it passes out of the unit through the opposing spiral end surface.

3,722,697

INTRAVENOUS INJECTION APPARATUS DRIP CHAMBER HAVING FILTER MEANS

George K. Burke, and Kenneth Raines, both of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

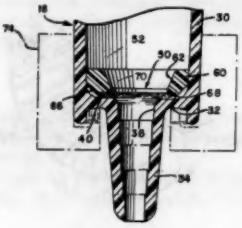
Filed April 29, 1970, Ser. No. 32,791

Int. Cl. B01d *35/00*

U.S. Cl. 210—451 **5 Claims**

An intravenous injection apparatus drip chamber comprises a tubular plastic member having a lower wall annular shoulder around said outlet hole. A filter means includes a flat metallic filter having raw outer edges which is disposed within a recess

in the bottom of a plastic filter ring. The filter ring has a lower tapered portion which is ultrasonically fused to the annular



shoulder on the lower wall of the drip chamber. The filter ring is also bonded to the outer periphery of the metallic filter.

3,722,698

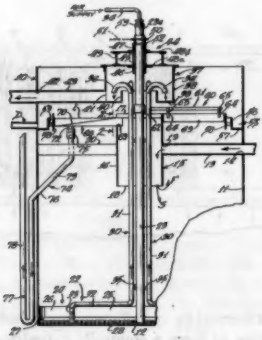
CIRCULAR CLARIFIER MECHANISM

Quentin L. Hampton, Ormond Beach, Fla., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 4, 1970, Ser. No. 86,892

Int. Cl. B01d *12/00*

U.S. Cl. 210—525 **13 Claims**



Apparatus for treating a liquid having settleable (sludge) and floating (scum) material therein to provide a clarified liquid, said apparatus including a cylindrical tank having a rotating mechanism therein for removing settled material from the bottom of the tank and for transporting floating material to a stationary radially extending trough. The mechanism is freely suspended within the tank, and is rotatably supported by structure that is disposed entirely above the liquid level. The mechanism is provided with generally radially disposed plow blades that sweep along the bottom of the tank, each blade including one or more pairs of converging sections that collect the settleable materials adjacent the junction of the converging sections. The inlet end of a pumping means is provided adjacent the junction of the converging sections of each blade, and the settled material is lifted upwardly through the center of the tank to discharge the material into an annular receptacle that is suspended from a support at the upper end of the tank above the liquid level. A scum outlet is provided in the bottom of the scum collecting trough and is connected to a scum discharge pump.

3,722,699

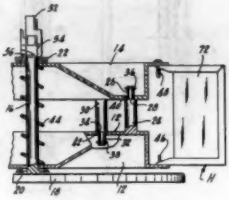
THEFT-PROOF MERCHANDISE DISPLAY HAVING A HANGING-TYPE HOLDER

Louis John Crossien, Grafton, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed Aug. 18, 1971, Ser. No. 172,625

Int. Cl. A47f *5/02, 5/10*

U.S. Cl. 211—169 **2 Claims**



A display device having a plurality of relatively movable support members provided with cooperable merchandise-receiving and display spindle elements. A holder is provided for being held on the spindle elements, one of the spindle elements having means for holding the holder in an open hanging position so that the holder need not be completely removed from the device when it is desired to remove the article.

3,722,700

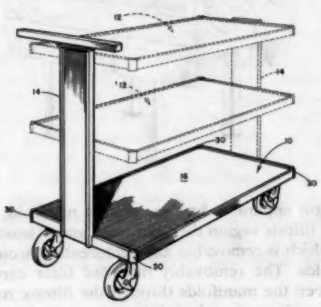
SHELF

Gilbert A. Cummings, Norwell, Mass., assignor to Peters & Co., Inc., Boston, Mass.

Filed April 26, 1971, Ser. No. 137,122

Int. Cl. A47b *95/00, 96/02*; **B62b** *5/00*

U.S. Cl. 211—153 **7 Claims**

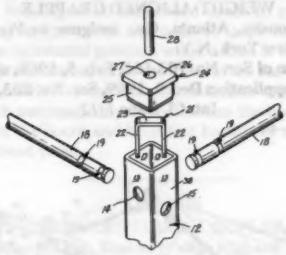


Shelf suitable for portable food service carts and manufacturable from sheet metal, forms a corner opening by foreshortening of side skirts while an elastomeric corner member filling the opening has a protruding bumper portion and leg surfaces along the inner surfaces of the side skirts. Features include inward lower flanges forming "C" shaped channels enclosing portions of the elastomeric corner member; welding of the flanges, bracing the side skirts; the elastomeric corner member under compression, urging the leg surfaces against the skirts; butting of the corner member against the ends of the foreshortened skirts; entire shelf formed of a single sheet of metal, providing a pair of horizontal positioning surfaces for the corner member; and the top of the corner member filling a corner cut-out in the top surface.

3,722,701
MODULAR FILE ELEMENT AND COMPONENTS THEREOF

Frank John Malcik, Berwyn; Edward William Whittemore, and John Patrick Clark, both of Elmhurst, all of Ill., assignors to Swingline, Inc., Long Island City, N.Y.

Filed May 7, 1971, Ser. No. 141,317
Int. Cl. A47f 5/10
U.S. Cl. 211—177 10 Claims

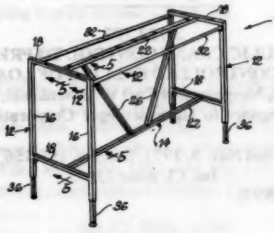


A joint structure for use in a filing rack of the type which may be utilized to support loose-leaf binders or the like in hanging relationship is disclosed. The joint structure is constructed to retain two rod-like elements of a rack structure together. The joint structure includes a hollow support member having two pairs of aligned holes for receiving the rod-like elements and a specially constructed locking means which coacts with a specially configured arrangement of grooves in the rod-like elements interior of the hollow support member to retain the rod elements in place relative to each other and relative to the hollow support member.

3,722,702
FOLDABLE GARMENT RACK

Edwin M. Marker, Jr., Chicago, Ill., assignor to Garcy Corporation

Filed March 22, 1971, Ser. No. 126,451
Int. Cl. A47f 5/10
U.S. Cl. 211—178 R 18 Claims

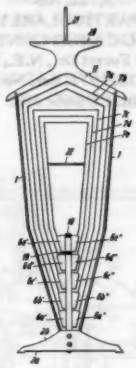


A completely foldable garment rack construction which is easily and quickly set up, and easily folded, without removal of hang rails, and without separate mechanical fasteners. Eccentric cam hinge assemblies connect the frame members for movement between a butting, set-up and locked condition, and a spaced foldable condition. A hang rail is hingedly mounted for pivotal movement on the rack with respect to a frame member, from the foldable condition into a folded condition. Legs of frame members telescopically receive leg extenders, each defining longitudinally spaced notches and notch cam tongues for camming a spring assembly outwardly when the leg extender is pulled downwardly to lengthen the leg. The spring assembly includes an integral supporting tab for supporting the spring assembly from a stretcher adjacent the leg, and provides a catch button passing through the leg and into a notch to support the leg extender against upward telescopic movement.

3,722,703
SILENT BUTLER

Heinz Domin, Marienburgerstr. 64, Espelkamp-Mattwald, Germany

Filed April 30, 1971, Ser. No. 138,953
Int. Cl. A47f 5/10
U.S. Cl. 211—178 R 9 Claims

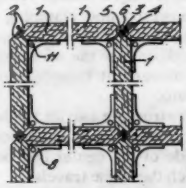


A base is provided with a first pair of uprights the upper free end portions of which are connected by a garment hanger which forms with the uprights a first frame. A pair of arms is pivoted to the base and at least one connecting element pivotally links the arms to form therewith a parallelogram linkage. At least one second pair of uprights is mounted on the connecting element and has free end portions which are again connected by a second garment hanger forming with them a second frame which is so dimensioned that it can be tilted into and out of the confines of the first frame.

3,722,704
STRUCTURAL COMPONENTS FOR THE COMPOSITION OF DISASSEMBLABLE PIECES OF FURNITURE

Giancarlo Piretti, Bologna-via Corticella, Italy, assignor to Anonima Castelli S.A.S., Bologna, Italy

Filed July 21, 1971, Ser. No. 164,592
Claims priority, application Italy, July 23, 1970, 52341 A/70
Int. Cl. A47f 5/00
U.S. Cl. 211—183 4 Claims



Structural components pieces of furniture comprising a plurality of panels, angle members and closing plates, wherein:

the panels have longitudinal edges including first coupling formation and a complementary coupling formation extending along said longitudinal edge, said first coupling formation of each panel being able to be interfitted with the second coupling formation of another panel designed to be slidably interlocked with the former panel whereby two panels can be interlocked at a right angle;

the angle members, designed to stiffen the connection between two panels and to prevent sliding movements parallelely to their longitudinal edges and provided with means for its fixing to said panels; and

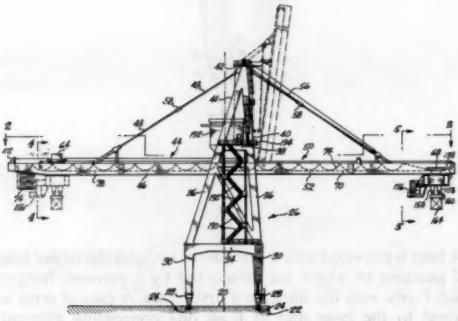
the closing places are each constituted of a board or sheet provided with means adapted to be engaged into the holes provided in the angle members.

3,722,705

MARINE CRANE, PARTICULARLY DESIGNED FOR HANDLING CARGO CONTAINERS

Charles D. Gould, 8225 Forest Dr., N.E., Seattle, Wash.

Filed May 28, 1971, Ser. No. 147,753
Int. Cl. B66c *5/02*
U.S. Cl. 212—15 **14 Claims**



There is disclosed a mobile crane for loading and unloading marine vessels. The crane is mounted for travel on widely spaced apart runway track means extending parallel to the waterside edge portion of a marine pier. The crane comprises a central tower structure supporting a fixed boom extending therefrom in a shoreside direction and a hinged boom supported thereby extending therefrom in a waterside direction.

A traveling counterweight means is mounted for travel only over the fixed boom and at a given level and a load supporting means is mounted for greater travel than said counterweight means and travels over both said fixed boom and said hinged boom and at a lower level than said counterweight means. Preferably, the travel of the counterweight means is one-half that of said load supporting means. The counterweight means and the load supporting means are interconnected and preferably by wire rope and sheave means and in a way to provide a two-part reeving system between the load supporting means and the counterweight means. Also, the load supporting means is self-powered and clamping means, preferably hydraulically operated, are carried by said load supporting means to engage or disengage the wire rope means and cause selective traveling movement thereof and of counterweight means secured thereto.

The central tower structure carries the boom hoist machinery and the center of mass of such machinery and of the tower structure is waterside of the center line between the runway track means on which the crane travels.

The boom hoist machinery is electrically powered and positioning limit switch means are included in the electric circuitry of such hoist machine so that predetermined positions of said traveling counterweight means and said load supporting means must obtain before the boom hoist machinery is operable.

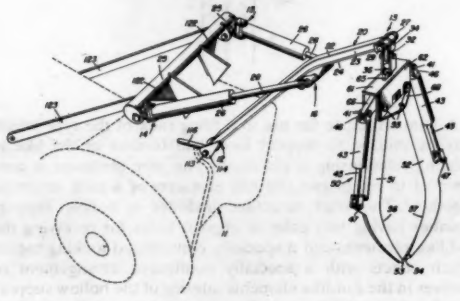
The traveling load supporting means carries a rectangular frame which is designed for use in loading and unloading large bulky loads, as cargo containers, from marine vessels which may have a list and/or trim. A power actuated means is provided for determining the angular relation of said rectangular frame to a horizontal plane and thus permitting adjustment thereof to match the particular trim of the marine vessel being loaded or unloaded. Such power actuated means is shown as being hydraulic. A plurality of rope means depend from said rectangular frame and the relative lengths thereof are selectively power actuated to compensate for the list of the marine vessel.

3,722,706

WEIGHT-ALIGNED GRAPPLE

Joseph E. Blonsky, Atlanta, Ga., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 703,155, Feb. 5, 1968, abandoned.
This application Dec. 9, 1969, Ser. No. 883,653
Int. Cl. B66c *1/12*
U.S. Cl. 212—44 **8 Claims**



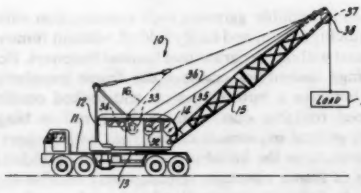
A grappling device which includes a powered, rotatable grapple for grasping elongated objects. The grapple is normally attached by a support to a logging vehicle such as a skidder. The support is a movably-mounted boom which is controlled by a pair of hydraulic cylinders for effecting vertical and sidewise movement of the boom. The grapple comprises a weight-actuated cam as a rotative positioning means for self-alignment of a pair of co-acting powered grapple jaws, an elongated bridge connecting said grapple jaws whereby generally uniform pressures are exerted upon grasped objects.

3,722,707

HYDRAULIC CRANE CONTROL TO PREVENT UNCONTROLLED FALLING OF LOAD

Nils E. Hedeen, Mequon, and Carl W. Javenkoski, Sussex, both of Wis., assignors to Harnischfeger Corporation, Milwaukee, Wis.

Filed Nov. 3, 1971, Ser. No. 195,156
Int. Cl. B66c *23/06*
U.S. Cl. 212—59 R **9 Claims**



A boom crane comprises a platform on which a vertically movable boom, a front hoist drum, a rear hoist drum, a boom hoist drum, swing drive and an engine are mounted. The platform is rotatable in either direction about a vertical axis. The boom can be raised or lowered about a horizontal axis by

means of a boom hoist line on the boom hoist drum. The front and rear drums are operable alternately to hoist and lower loads on their respective hoist lines. The aforesaid functions are controlled by a hydraulic control system which includes various levers and pedals that control hydraulic valves to regulate pressurization of various hydraulic clutch and brake cylinders. The control system comprises a selectively operable "-dead man" actuation control for the front hoist drum and another "dead man" actuation control for the rear hoist drum. When actuated, each "dead man" actuation control effects automatic braking of its associated drum to prevent its load from falling in the event the control lever for that drum is returned to its neutral position while a load is being hoisted or lowered by that drum, as in the case when the crane operator is incapacitated. The control system further comprises a dump valve which automatically depressurizes the hydraulic system, in the event the boom and hoist line hooks are raised beyond a predetermined point.

3,722,708

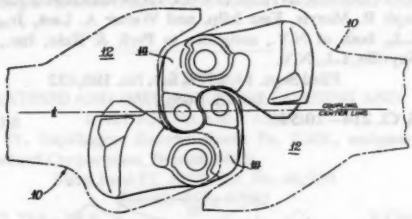
REDUCED SLACK COUPLER

Forrest Fothergill Ion, Itasca; Walter Richard Polanin, Hazelcrest, both of Ill., and Russell George Altherr, Munster, Ind., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Dec. 8, 1971, Ser. No. 205,917

Int. Cl. B61g *1/06, 3/04*

U.S. Cl. 213—151 **6 Claims**



A modified type "E" coupler having a knuckle with a horizontal contour extending forwardly and angularly for reducing slack when coupled with either an "E" or "F" coupler, and a vertical contour tapering and curving for allowing vertical angling in area contact condition.

3,722,709

CONVEYING AND COOLING LENGTHS OF SEMI-FINISHED PRODUCTS

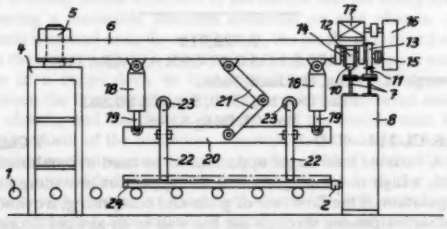
Horst Buschmann, Solingen-Ohligs, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed March 23, 1971, Ser. No. 127,123

Claims priority, application Germany, March 28, 1970, P 20 14 994.4

Int. Cl. B65g *63/04*

U.S. Cl. 214—1 BC **7 Claims**



In conventional continuous casting plants and heavy rolling mills, there is a run-out table at the end of the plant or mill, and a cooling bed running at right angles to the run-out table. The invention improves the utilization of factory space by having the cooling bed parallel to the run-out table and by turning the lengths of semi-finished products through about 90° while transferring them from the run-out table to the cooling bed.

3,722,710

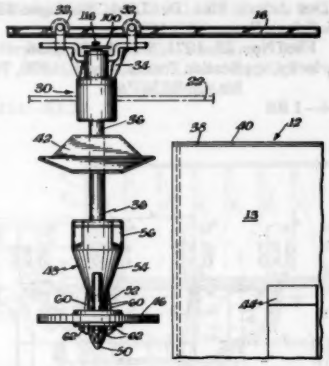
WORK CARRIER FOR ABRASIVE CLEANING ARRANGEMENTS

Bernard W. Ixer, and Davis Lee Baughman, both of Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,362

Int. Cl. B66c *1/66*

U.S. Cl. 214—1 BA **6 Claims**



A work carrier for use in abrasive cleaning arrangements comprises a support movable in a forward direction with generally vertical work engaging arms having hook-like projections for moving into and out of a work engaging position.

3,722,711

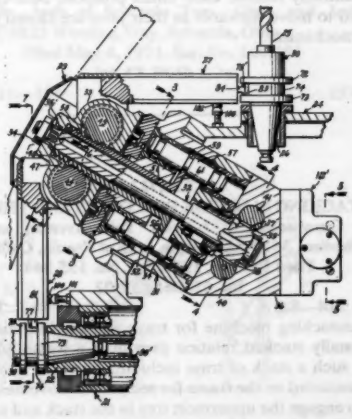
MACHINE TOOL

William B. Seidel, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed April 15, 1970, Ser. No. 28,742

Int. Cl. B23q *5/32*

U.S. Cl. 214—1 BD **14 Claims**



A pair of arms is employed to transfer tools between a tool storage mechanism and a spindle. The arms are independently

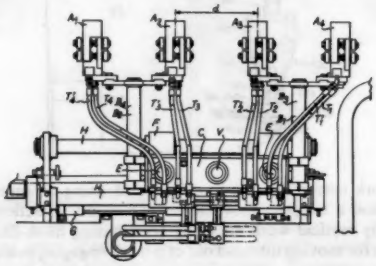
pivoted on a rotating shaft, which rotates the arms between the spindle and the tool storage mechanism, so that the arm, which is supplying a tool to the tool storage mechanism, can be held in a parked position until a desired pocket in the tool storage mechanism is positioned to receive the tool. A unique gripping arrangement releasably connects the tool to the arm and requires only a simplified cooperating structure on a holder for the tool.

3,722,712

WORKPIECE TRANSFER DEVICES

Henri Knierim, Boulogne-Billancourt, France, assignor to Societe Des Aciers Fins De L'est, Boulogne-Billancourt (Hauts de Seine), France

Filed Nov. 29, 1971, Ser. No. 202,856
Claims priority, application France, Dec. 8, 1970, 7044122
Int. Cl. B23q 7/04
U.S. Cl. 214—1 BB 5 Claims



This device for transferring workpieces or blanks, notably in a forging press, from one working station to another, in a sequence of working stations comprising for example forging dies, is collapsible and comprises a plurality of clamps adapted to grip the blanks, release them completely from the dies and move same laterally through a distance corresponding to the gap between adjacent dies, and lay the blank into the next die, and eventually resume their initial position. Said clamps are designed to move forwards as their jaws are closed through a toggle mechanism.

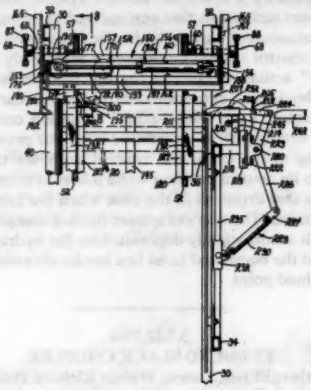
3,722,713

UNSTACKING MACHINE FOR TRAYS AND THE LIKE

Joseph Garabedian, 737 West Yale Avenue, and Mike Garabedian, 341 South Maple, both of Fresno, Calif.

Filed June 23, 1971, Ser. No. 155,944
Int. Cl. B65g 59/02
U.S. Cl. 214—8.5 A 16 Claims

An unstacking machine for trays and the like disposed in elevationally stacked relation providing a frame adapted to receive such a stack of trays including powered tray pick-off means mounted on the frame for reciprocal movement successively to engage the uppermost tray in the stack and to remove it laterally substantially horizontally from the stack and powered stack elevating means on the frame operative upwardly to advance the stack through successive increments of travel to position each succeeding uppermost tray in the path



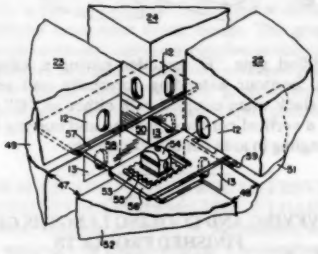
of movement of said pick-off means for removing the trays one at a time from the stack.

3,722,714

CONTAINER INTERCONNECTION ARRANGEMENT

Joseph R. Morris, East Islip, and Walter A. Last, Jr., Islip, L.I., both of N.Y., assignors to Peck & Hale, Inc., West Sayville, L.I., N.Y.

Filed Sept. 14, 1971, Ser. No. 180,432
Int. Cl. B65g 1/14
U.S. Cl. 214—10.5 R 8 Claims



Interconnecting rectangular freight containers in a container stowage system having one or several tiers of containers in order to prevent relative movement horizontally and provide for variation in container spacing. This is accomplished by the use of interlock stacker units, and spacer plates or bridge fittings and, for the top tier, locking pins to secure or capture the spacer plates.

3,722,715

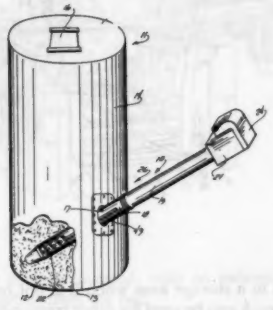
VARIABLE LOAD AUGER APPARATUS

George M. Young, Oakland, Nebr.

Filed Oct. 15, 1970, Ser. No. 80,862
Int. Cl. B65g 65/46
U.S. Cl. 214—17 D 7 Claims

A variable load auger apparatus to be used in combination with a high moisture grain bin, the apparatus providing for a regulation of the flow rate of grain and comprising; a cylindrical sleeve passing through the bin wall in an airtight fitting, a portion of the interior end of the sleeve having the top half removed therefrom; a cylindrical tube rotatably disposed

within the sleeve having its exterior end secured to a delivery hopper and a portion of its interior end having the top half removed therefrom; an annular gasket abutting the upper end of the sleeve and held between the sleeve and the tube by a clamp, the basket providing an airtight fitting between the two; and a helical auger rotatably disposed axially within the



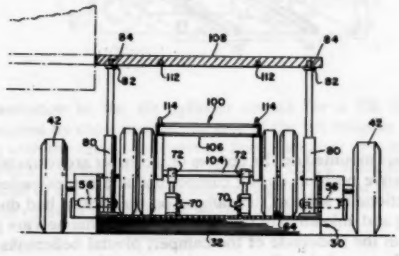
tube having its lower end exposed by the cutaway portion of the tube and having its upper end extend through the delivery hopper to be mechanically secured to a constant-speed drive motor, wherein the tube is rotatable within the sleeve to vary the opening therebetween in contact with the grain, thus providing a variable delivery rate without breaking the seal of the bin.

3,722,716

METHOD AND APPARATUS FOR LOADING AND UNLOADING AIR CARGO

Keith W. Tantlinger, Rancho Santa Fe, Calif., assignor to Fruehauf Corporation, Detroit, Mich.

Filed June 17, 1970, Ser. No. 46,930
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 B **8 Claims**



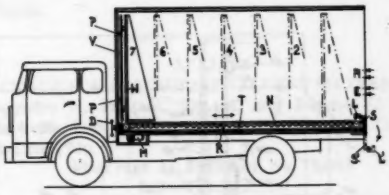
In a first form of the invention, a mobile unit includes means for accurately locating a road-worthy chassis thereon. Lifting and lowering means is carried by the mobile unit for lifting and lowering a moveable platform mounted on said chassis. A chassis is moved onto the mobile unit, the platform is raised so that the upper surface is substantially flush with the upper surface of a cargo deck in the aircraft, cargo is transferred between the upper surfaces, the platform is then lowered onto the chassis, and the chassis is moved off the mobile unit. In another form of the invention, a mobile dock includes a load carrying portion supported by a plurality of wheel assemblies. Means is provided for raising and lowering the load carrying portion with respect to the wheel assemblies and comprises struts including cam operated steering means whereby the wheels are steered upon relative vertical movement of the load carrying portion with respect to the wheels. In this latter form of the invention, a road-worthy chassis is moved onto the load carrying portion of the mobile dock and the dock is them moved into operative position. The load carrying portion of the dock is raised until the upper load carrying surface of the road-worthy chassis thereon is substantially flush with the upper surface of the cargo deck, whereupon cargo is transferred between said upper surfaces. The dock is then moved away from the aircraft and the load carrying portion is lowered whereupon the road-worthy chassis is moved off of the mobile dock. Two forms of the invention may also be used in combination with one another wherein the upper surface of the platform supported above a chassis on the mobile unit may serve as a bridge for cargo passing thereover onto the upper load carrying surface of a chassis carried by a dock disposed adjacent the mobile unit.

3,722,717

CONVEYOR SYSTEM FOR LOADING AND UNLOADING TRUCKS

Leon K. Stryczek, P.O. Box 134, Brooklyn, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,515
Int. Cl. B60p *1/36*
U.S. Cl. 214—83.22 **3 Claims**



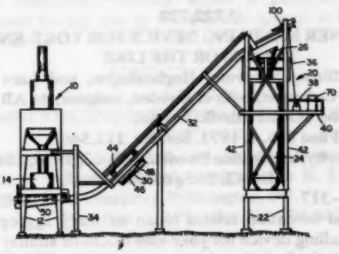
A conveyor movably receivable in a truck body for rapid loading and unloading of the truck comprises an endless band spanning a pair of end loaders and carries a wall member movable from one side of the truck body to the other. A brake, actuatable externally of the truck body, is provided to secure the band independently of a motor brake used to stop the conveyor, while a sill is provided at the rear of the body and is swingable downwardly out of the path of objects on the conveyor to permit loading and unloading. In its upper position, the sill lies in the path of any objects tending to be shifted rearwardly and actuates a control for cutting off the conveyor.

3,722,718

HYDRAULIC CONTROL SYSTEM FOR A SKIP HOIST

Joseph G. Gill, 6560 Wild Oaks Dr.; John H. Gill, 6540 Wild Oaks Dr., both of Sylvania Twp., Ohio, and Arthur J. Holmes, 5833 Winding Way, Sylvania, Ohio

Filed May 4, 1971, Ser. No. 140,191
Int. Cl. B66b *5/24*
U.S. Cl. 214—100 **15 Claims**



A reversible hydraulic motor for driving a windlass or winch for a cable connected to a skip and to cams that operate valves

and switches for controlling said motor, including a hydraulic retarder for the motion of the skip in one direction that stores energy for later starting the skip in the opposite direction, and safety means in the hydraulic system for said motor to stop the motor and skip when the hydraulic pressure in said system goes either above or below predetermined limits.

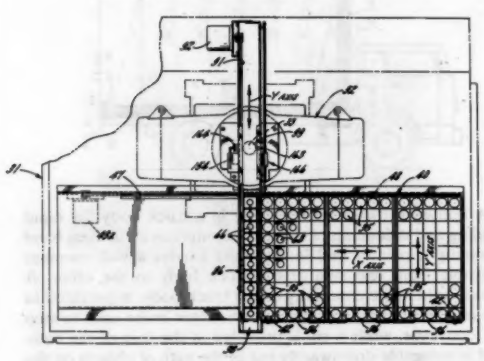
The skip reciprocates along an inclined track between a loading and an unloading station, such as for hot asphalt between its mixing plant and its hot storage bin. The skip may have a bottom door that automatically opens at its unloading station. The track may have a lower section that is movable away from the loading station when the skip and hot asphalt storage bin are not being used.

3,722,719

METHOD OF AND APPARATUS FOR SAMPLE VIAL TRANSFERRING AND CHANGING

Edmund Frank, Chicago, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed April 10, 1970, Ser. No. 27,411
Int. Cl. B65g *47/06*
U.S. Cl. 214—310 **13 Claims**



An automated method and associated apparatus is provided for transferring sample vials and like regularized objects from a rectilinear array past a counting station in seriatim order. The array is indexed along an X-axis in at least one tray, rows of the array are indexed out of the plane of the array tray along a Z-axis by a comb member into a bottomless carriage, and individual vials in the carriage are then indexed seriatim along a Y-axis past a counting station. Photoelectric sensors are provided to override portions of the indexing mechanism if no sample vials are present in array rows or individual compartments.

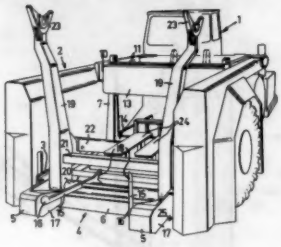
3,722,720

CONTAINER HANDLING DEVICE FOR YOKE-END TRUCKS OR THE LIKE

John Olov Hilding Sjostrom, Hoglandssjon, and Lars Erik Sundkvist, Gullanget, both of Sweden, assignors to AB Hagglund & Soner, Ornskoldsvik, Sweden

Filed Feb. 4, 1971, Ser. No. 112,546
Claims priority, application Sweden, Feb. 12, 1970, 1806/70
Int. Cl. B65g *65/00*
U.S. Cl. 214—317 **10 Claims**

The present invention relates to an auxiliary aggregate a container handling device for yoke-end trucks or similar vehicles having vertically adjustable, essentially horizontal lifting means. The handling device is designed to lift, carry and dump, by tipping, heavy containers, preferably slag ladles or the like. The handling device shall be of such a type that it can be supported by the lift beams of the truck and can be easily



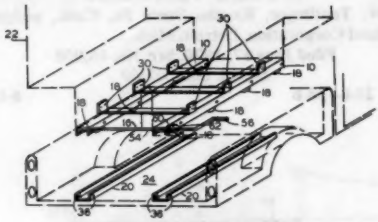
set down in a storage area when it is not required for use so that the truck can be used for other transporting purposes.

3,722,721

MEANS FOR LOADING AND UNLOADING A CAMPER

Melvin L. Bennett, 2739 South Martinson, Wichita, Kans.

Filed July 13, 1971, Ser. No. 162,183
Int. Cl. B60p *3/38*
U.S. Cl. 214—515 **6 Claims**



Rollers mounted on the bottom of a camper are retracted to inoperative position during camper use and are extended to antifrictionally support the camper on the pickup bed during loading and unloading of the camper. Upper channels are provided on the underside of the camper; pivotal bellcranks are pivotally mounted in the upper channels with the rollers supported on one set of arms of the bellcranks and the other set of arms engaging a common rod shifted to extend the rollers; gear and crank means move the common rods; and lower channels on the bed guide the rollers.

3,722,722

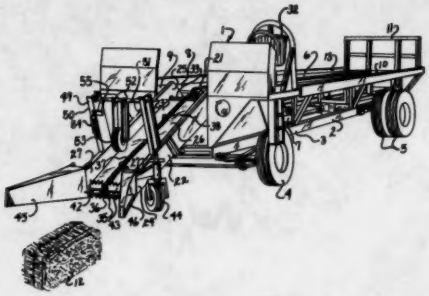
SELF-PROPELLED BALE HANDLING APPARATUS

Calvin B. Blair, P.O. Box 76, Barnard, Kans.

Filed April 5, 1971, Ser. No. 131,096
Int. Cl. B60p *1/38*
U.S. Cl. 214—522 **4 Claims**

A self-propelled vehicle has a flat elevated bed with a conveyor extending therealong from front to back. An elongated header extends forwardly and downwardly from the bed front, riding on the ground at the front end, and has a conveyor chain thereon coordinated with the bed conveyor. Structure is provided for funneling hay bales onto the header and holding

the bales in proper position thereon for transmission to the rear end of the bed for stacking. The conveyors may be



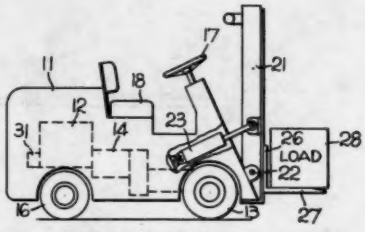
reversed and the header elevated, with an extension fitted thereon, for off-loading from the bed.

3,722,723

TILT CYLINDER ANTICAVITATION CIRCUIT

Dean A. Matthews, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 20, 1972, Ser. No. 219,414
Int. Cl. B66f 9/20
U.S. Cl. 214—674 **8 Claims**



Cavitation in the tilt cylinder circuit for a lift truck is prevented by cross connecting one of the tilt cylinder supply lines with the return-to-reservoir line of another circuit in the lift truck hydraulic system. A cone-way check valve is incorporated in the cross connecting passage to prevent flow from the tilt cylinder circuit to the second circuit.

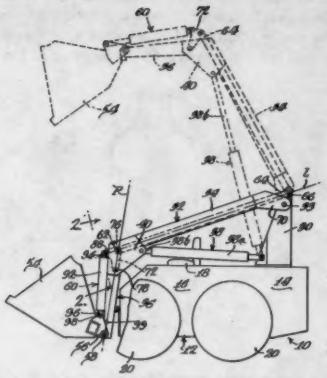
3,722,724

LOAD CARRYING DEVICE WITH IMPROVED POSITION CONTROL

Richard P. Blakely, Rockford, Ill., assignor to J. I. Case Company

Filed April 19, 1971, Ser. No. 135,302
Int. Cl. E02f 3/86
U.S. Cl. 214—776 **6 Claims**

A material handling device having a bucket pivoted on the free ends of lift arms that extend on opposite sides of a vehicle body and are pivoted on uprights extending from the body adjacent the rear end thereof. The material handling device incorporates pivot means for tilting the bucket and automatically maintaining the bucket in a level condition as the lift arms are raised. The pivot means includes a pair of links that are supported within the hollow lift arms with a fluid motor located between one of the links and the material handling implement that is pivoted on the free end of the lift arms. The links and hollow lift arms are constructed and arranged to



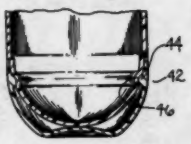
allow unrestricted movement of the links within the lift arms while the lift arms are pivoted between raised and lowered positions.

3,722,725

PACKAGE FOR PRESSURIZED FLUENT MATERIALS - A

Bhupendra N. Khetani, Vernon, and Eugene F. Phillips, Rockville, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 24, 1970, Ser. No. 75,095
Int. Cl. B65d 23/00
U.S. Cl. 215—1 C **4 Claims**



A package for pressurized fluent materials which includes a bottle made of a high strength moldable thermoplastic with a hemispherical base configuration to minimize stress buildup in the bottle as a result of the pressure of the contents. Means are formed in the bottle for cooperating with a support member to maintain the otherwise unstable bottle in an upright position on a horizontal surface. Preferably, the shape of the support member is the same as that of the curved bottom portion of a conventional self supporting bottle for holding carbonated beverages. The thermoplastic of the bottle preferably has a major component therein which is polymerized from a monomer having one or more nitrile groups in its molecular structure.

3,722,726

NONEVERTING BOTTOM FOR THERMOPLASTIC BOTTLES

Keith Stewart Carmichael, and Joseph Thomas Lester, Jr., both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 1, 1971, Ser. No. 194,643
Int. Cl. B65d 1/02
U.S. Cl. 215—1 C **7 Claims**

A generally cylindrical thermoplastic bottle for bottling liquids under pressure such as beer, soda and aerosols, having

a noneverting bottom under conditions of bottling and use. The bottom is a shell having a configuration consisting essentially of a series of geometric curves rotationally symmetrical about the central axis of the bottle starting at the generally right cylinder section with an ogive extending toward the bottom of the bottle connected to a toroid that forms the seat of the bottle and turns upward into the interior of the bottle connected to a straight line angled towards the center of the bottle forming a re-entrant cone that is connected to a recessed toroid that turns away from the interior of the bottle ending in a straight line perpendicular to the central axis of the bottle forming a recessed disc in the bottom of the bottle. Alternatively, the bottom geometry can be modified by expanding the recessed toroid and adding a reinforcing ring of polymer on the interior of the recessed toroid.

3,722,727

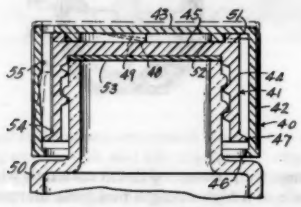
SAFETY CLOSURE FOR A MEDICINE BOTTLE

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 134,702, April 16, 1971, Pat. No. 3,679,085. This application June 29, 1971, Ser. No. 157,850

Int. Cl. B65d *55/02*

U.S. Cl. 215—9 **5 Claims**



A child-proof closure for a medicine bottle or the like. The closure consists of a threaded cap and relatively flexible overcap or driver. The cap and driver have cooperating ratchet drive means for screwing the cap onto the bottle by rotating the driver. The driver normally is rotatable in the opposite direction relative to the cap. The cap has a recess in its outer wall and a portion of the wall of the driver is radially inwardly displaceable for engagement in the recess for delivering unscrewing torque from the driver to the cap.

3,722,728

NURSING DEVICE

Seiichi Yazaki, Sakai City, Japan, assignor to The Fujimoto Company Ltd., Osaka, Japan

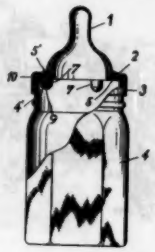
Filed Aug. 26, 1971, Ser. No. 175,166

Claims priority, application Japan, Sept. 8, 1970, 45/78604

Int. Cl. A61j *9/00*

U.S. Cl. 215—11 B **5 Claims**

A nursing device which consists of a bottle, a main nipple body with an aperture for extrusion of milk, a grooved flange member having tubular extensions integrally formed therewith and extending from the underface thereof, an air control ring with a central hole for receiving the main nipple body, the periphery of which fits the groove of the flange and solid grooved protrusions extending from the underside of said air control ring for corresponding relation to the tubular members of the flange of the main nippled body, and a fastening ring to secure the main body and air control ring combination to the mouth of the bottle.



3,722,729

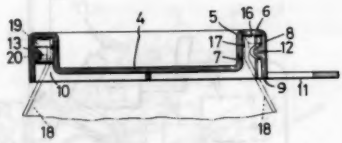
BOTTLE CAP STRUCTURE AND METHOD FOR MAKING THE SAME

Eiji Yamada, 103 2-1 Hamacho, Nihonbashi, Chuoku, Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 65,856

Int. Cl. B65d *41/22*

U.S. Cl. 215—41 **1 Claim**



A bottle cap of inverted concave shape in its cross section made of blank material of synthetic resin of high resiliency such as polyethylene or the like, wherein a horizontal, raised recess is formed on the center surface of the cap, and a bottle opening abutting channel is defined by the periphery of the cap and the wall of the recess on the backside of the cap, and projecting strips are provided integrally with the inner wall of the periphery at the base side of a tongue projecting from and secured to the periphery at right angle thereto and at the opposite side to the base on the backside of the periphery, cut-out portions are formed on opposite sides of the projecting strips, said cut-out portions extending to the depth adjacent to the cap periphery, and small projecting strips encompassing the backside wall of the recess are provided.

3,722,730

MANHOLE COVER CONSTRUCTION

Erhard Joos, Wilhelmstr. 15, Korntal, near Stuttgart, Germany

Filed Sept. 25, 1970, Ser. No. 75,502

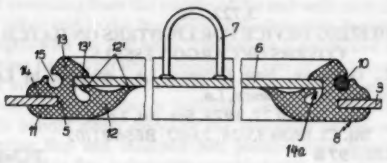
Claims priority, application Germany, Oct. 6, 1969, P 19 50 286.4

Int. Cl. B65d *53/00*

U.S. Cl. 220—46 R **10 Claims**

A wall portion of a vessel has an opening. An annular sealing element of elastomeric material is provided in its radially outer side with a circumferentially extending groove accommodating the marginal zone of the wall portion bounding the

opening. The radially inner side of the sealing element is provided with a similarly circumferentially extending groove extending the circumferential edge portion of a closure member for the opening. The radially inner side is further provided at opposite axial sides of its groove with radially inwardly projecting lids which sealingly and supportingly engage the closure member from opposite axial sides. The arrangement may also be reversed so that the sealing lids are located at the outer side and engage the marginal zone of the wall portion from opposite axial sides.



3,722,731

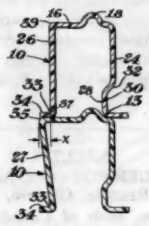
INSET COVERALL LID FOR CONTAINERS

Robert J. McCormick, and Charles E. Fitzgerald, both of Findlay, Ohio, assignors to The Dow Chemical Company, MIdland, Mich.

Continuation-in-part of Ser. No. 827,219, May 23, 1969, Pat. No. 3,589,552. This application May 4, 1970, Ser. No. 34,380The portion of the term of this patent subsequent to June 29, 1988, has been disclaimed.

Int. Cl. B65d *43/10*

U.S. Cl. 220—60 **5 Claims**



An improved thermoformed plastic inset coverall lid for use with a container for food products or the like. The lid includes inclined stacking bosses around its peripheral rim so as to prevent jamming. A locating ring about the top surface of the lid rim is employed to maintain the lids aligned in a free stack to maximize benefit of the stacking bosses.

3,722,732

END WALL FOR DRUMS AND OTHER CONTAINERS FOR LIQUID OR SOLID STATE PRODUCTS

Karl Knut Harry Edlund, 26, Terserusvagen, Bromma, Sweden

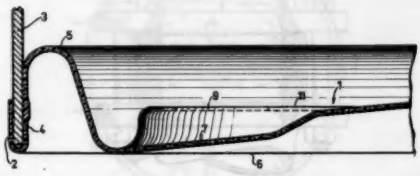
Filed Oct. 13, 1970, Ser. No. 80,446

Claims priority, application Sweden, Oct. 17, 1969, 14269/69

Int. Cl. B65d *7/42*

U.S. Cl. 220—66 **2 Claims**

An end wall structure for drums and other containers adapted to hold products in liquid or solid state in which the end wall is an integrally-formed, elastic, plastic structure having a central portion which is curved inwardly with respect to a plane through the end edge surface of the drum and which is deformable from such inwardly curved configuration to an outwardly curved configuration when substantial force is applied from the interior of the drum as a result of a shock resulting from dropping the drum, etc., and which then extends toward the periphery of the end wall and toward the plane through the end edge of the drum as an outwardly curved configuration, a curved outer portion extending from the outwardly curved configuration to the inner surface of the shell of the drum and thence in a substantially straight part parallel to the inner surface of the drum and having a sufficient curvature to resiliently take up and dampen the forces resulting from the outward deformation of the central portion and return the central portion to its original inwardly curved position and a peripheral flange portion extending from the outer portion and adapted to secure the end wall on the shell of the drum cover the edge surface of the drum.



3,722,733

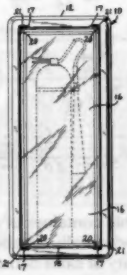
FIRE EXTINGUISHER CABINET

Richard A. Neumann, 510 - 13th Avenue, N.W., New Brighton, Minn.

Filed May 17, 1971, Ser. No. 143,971

Int. Cl. B65d *25/54*

U.S. Cl. 220—82 R **1 Claim**



A molded housing having an outwardly opening cavity therein with an indentation around the edge thereof and a sheet of glass positioned therein. The sheet of glass is maintained in position by overlying plates in each corner affixed to the housing by allen headed bolts or the like. The width of the indentation is increased at the corners of the glass to receive the plates and the allen screws.

3,722,734

SAFETY RELIEF DEVICE

John H. Raidl, Jr., 6625 Millhaven Dr., Mission, Kans.

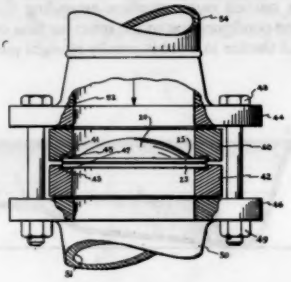
Filed Aug. 17, 1970, Ser. No. 64,182

Int. Cl. B65d *25/00*

U.S. Cl. 220—89 A **8 Claims**

A rupture disc and assembly is provided with a reverse acting frangible disc having a relieved burst pattern. The disc is positioned with its convex surface directed upstream and supports a diaphragm seal. When the relief pressure is reached, the disc snaps over center and assumes the configuration of a prebulged frangible disc. A burst pattern is cut or relieved in the dome of the disc to fail at a pressure less than the snap

over pressure so that pressure causing snap over results in failure and bursting of the disc. To prevent premature tensile failure, a partial support member is positioned to overlay the

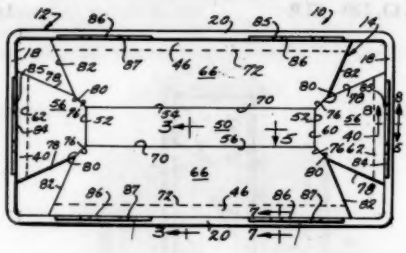


relieved pattern. In this manner, a highly precise reverse acting structure is provided without the necessity to include in the assembly a punch such as is normally provided with a reverse acting, frangible disc device.

3,722,735

STACKABLE AND NESTABLE CONTAINER

Ralph H. Herolzer, Cincinnati, Ohio, assignor to Vanguard Industries, Inc., Cincinnati, Ohio

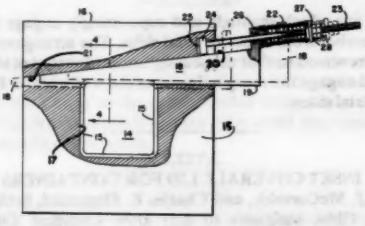
Filed Jan. 22, 1971, Ser. No. 108,770
Int. Cl. B65d *21/06*
U.S. Cl. 220—97 E **12 Claims**

A stackable and nestable container of molded construction including a generally horizontally extending rigid peripheral structure having a plurality of sides defining an open top area of fixed dimensions, a plurality of side walls fixed at their upper end portions with respective sides of the peripheral structure and a bottom structure connected with the lower end portions of the side walls between a stacking position wherein the side walls extend vertically downwardly from the peripheral structure so that a plurality of like containers can be stacked one on top of the other during transportation when filled and a nesting position wherein the side walls extend downwardly and inwardly from the peripheral structure so that a plurality of like containers can be nested one within the other during storage and transportation when empty. The bottom, side and top structures of the container when in the stacking position define a containing space of generally rectangular configuration in plan bounded by two parallel ends and two parallel sides of a length approximately twice the length of the ends, the upper and lowe surfaces on the container having three sets of upper and lower stacking elements permitting the container to be mounted in vertically stacked relation with a container disposed thereabove or therebelow in any of the following formations: (1) with the sides and ends thereof in vertical alignment with the sides and ends of the other container, irrespective of end-to-end orientation and adjacent upper and lower stacking elements interengaged or, (2)) with either half of said container vertically aligned with either half of a vertically adjacent container and the other half of said container extending horizontally outwardly from said vertically adjacent container beyond either end thereof or either half of either side thereof and with the adjacent upper and lower stakcing elements interengaged.

3,722,736

STABILIZING DEVICE FOR LIGHTERS ON HATCH COVERS OF CARGO VESSELS

Jerome L. Goldman, New Orleans, La., assignor to Lash Systems, Inc., New Orleans, La.

Filed March 17, 1971, Ser. No. 125,046
Int. Cl. B63b *35/28, 25/02;* **B65d** *21/02*
U.S. Cl. 220—97 B **7 Claims**



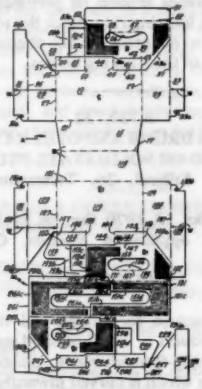
The invention involves the securing of the second or upper lighters upon lighters previously positioned on the tops of hatch covers, the first or under lighters being secured to the tops of the hatch covers by wedges in the ordinary way. Present standard lighters are constructed with four corner posts having upper cap projections of at least partial frustopyramidal shape and lower castings having base sockets conforming to the same shape so that the sockets of the second or upper lighters will receive the cap projections of the lower lighters. The invention involves certain spring-activated wedges carried by the socket castings or housings whereby loose fits and the shifting of lighters incident to sea conditions are avoided.

3,722,737

CARRIER FOR CONTAINERS

Robert G. Hughes, Rexdale, Ontario, and Lloyd B. Ruetz, Cooksville, Ontario, both of Canada, assignors to Continental Can Company of Canada Limited

Filed Aug. 17, 1970, Ser. No. 64,268
Int. Cl. B65d *5/48*
U.S. Cl. 220—113 **23 Claims**



A carrier for bottles or the like made from a single blank of paperboard by cutting, creasing, folding and gluing. The carri-

er has an open-top structure made of base, side and end walls and a central upstanding handle extending between the end walls and connected to the side walls by spaced apart straps. The handle is a sandwich structure of parts juxtaposed and adhered together and made up of main outer panels integrally connected at one end to spine-forming panels integral with and extending from the middle of the end walls and adhered at the other end to the free ends of similar spine-forming panels integral with the end walls. The handle is reinforced by a reinforcing flap integrally connected to one of the handle panels and inturned and sandwiched between the respective handle panels. A fold-in flap is integrally connected to the ends of each handle panel opposite the integrally connected spine-forming flap and inturned into juxtaposition therebetween. Each fold-in flap is desirably provided with a window reducing the thickness of the sandwich structure at that zone and allowing access for the end of a spine-forming flap through the windows to an adhesive connection with the underlying main handle panel. The manufacture of the carrier is completed "in the flat" and it is set-up by pulling out the sides and pushing up the base into a locking structure.

3,722,738

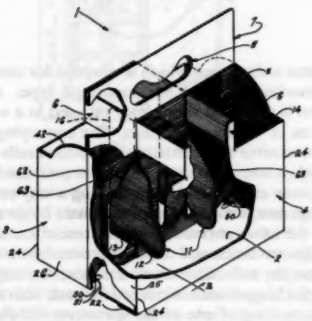
BEVERAGE BOTTLE CARRIER

William H. Wright, Cincinnati, Ohio, assignor to The C. W. Zumbiel Company, Cincinnati, Ohio

Filed March 4, 1971, Ser. No. 121,035

Int. Cl. B65d *75/00*

U.S. Cl. 220—113 **12 Claims**



A one-piece bottle carrier formed of sheet material for confining and transporting returnable beverage bottles in group formation in which the individual bottles are isolated from one another in individual cells. The carrier comprises a container having a longitudinal, centralized partition or bottle separator including an upstanding hand grip portion. The longitudinal partition includes transverse separators which, in combination with the longitudinal partition, delineate the individual cells to prevent contact between the bottles. The carriers are furnished in flat condition and the transverse separators hingedly flip to their right angular positions relative to the longitudinal partition in an automatic manner as the assembled flat blank is erected from the flat, assembled condition to form the cells which prevent chipping or damage to the bottles.

3,722,739

PILL DISPENSER HAVING CLOCKWORK FOR PERIODIC DISPENSING

Martin Blumberg, Devon Valley Estates, Stellenbosch, Cape Province, Republic of South Africa

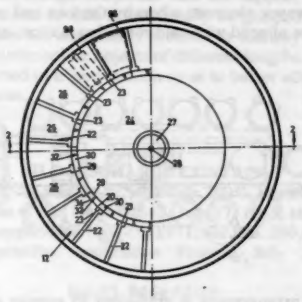
Filed March 22, 1971, Ser. No. 126,526

Claims priority, application Republic of South Africa, March 23, 1970, 1977

Int. Cl. B65b *57/18*

U.S. Cl. 221—3 **10 Claims**

This invention relates to a pill dispenser which is convenient to carry in a pocket or handbag. The dispenser is generally circular and has internally an annular ring of pockets for the pills. Two annular members cover the ring of pockets and have windows which register to expose any one pocket. A device con-



trolled by a clockwork timing mechanism prevents movement of the inner of the members into register with a further pocket until a pre-set time interval has expired.

3,722,740

DISCRETE ARTICLE SEPARATING AND DISPENSING APPARATUS, PARTICULARLY FOR MEASURED COUNTS OF PILLS, CAPSULES AND THE LIKE

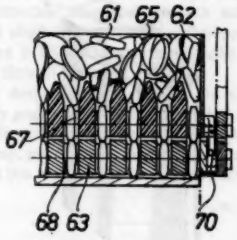
Hans List, Laustrasse 51, Stuttgart-Sonnenberg, Germany

Filed Nov. 11, 1971, Ser. No. 198,007

Claims priority, application Germany, Nov. 12, 1970, P 20 55 598.0

Int. Cl. B65g *65/32*

U.S. Cl. 221—7 **38 Claims**



A discrete article separating and dispensing apparatus having a drum, sub-divided by row and column dividers to form receiving receptacles for articles, such as pills. Further included is a feeding grid having a plurality of feeding receptacles which are selectively in registration with the receiving receptacles which are selectively in registration with the receiving receptacles of the drum for receiving articles from interior of the drum and feeding the articles to the drum receptacles. The feeding grid extends over a lower portion of the drum and is located interior of the drum and is preferably vibrated to enhance the feeding of articles to the receiving receptacles in the drum.

3,722,741

INDEXING CAROUSEL INFEED UNIT FOR CAN ENDS

Wallace W. Mojden, Hinsdale, Ill., assignor to Fleetwood Systems, Inc., Countryside, Ill.

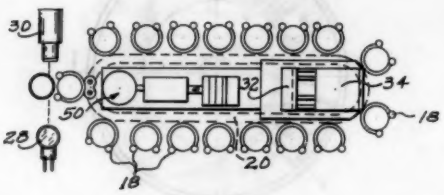
Filed March 22, 1971, Ser. No. 126,545

Int. Cl. B65h *7/14*

U.S. Cl. 221—11 **11 Claims**

A carousel type infeed unit for supplying can ends to a receiving station of a can processing line, or the like. The in-

feed unit employs drive means including an endless conveyor element to which is attached a plurality of carrier members capable of receiving and releasably retaining a stack of can ends. The drive means further includes an indexing arrangement capable of producing controlled, incremental movement of the conveyor element, whereby the can end carrier members may be aligned with said receiving station, at which time



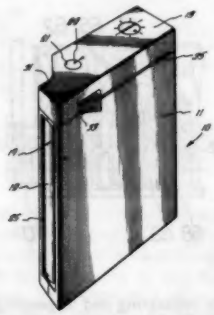
an ejector arrangement is employed to engage and forcibly transfer a stack of can ends from the aligned carrier member to the receiving station. In addition, there is disclosed control means adapted for use with the infeed unit, which control means monitors the supply of can ends at said receiving station so as to attain automatic operation of the infeed unit as the need for additional can ends arises.

3,722,742

TIMED CIGARETTE DISPENSER

Keith J. Wertz, Burbank, Calif., assignor to Charles A. Larrain, Northbridge, Calif.

Filed Dec. 27, 1971, Ser. No. 212,309
Int. Cl. B65b *59/00*
U.S. Cl. 221—15 **16 Claims**



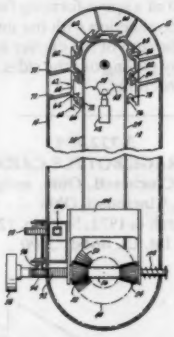
A timed cigarette dispenser is disclosed which is operable to eject cigarettes one at a time at predetermined time intervals. The dispenser comprises a case having a compartment for containing a quantity of cigarettes. A tubular ejector is rotatingly mounted on the case for ejecting one cigarette from the compartment and blocking the passage of the others. The ejector is operatively connected, via a trip wire, to a slide which is transversely movable across the top of the casing. The manual movement of the slider is controlled by a timing mechanism which functions to periodically release the slider for ejection purposes. The slider is also operatively connected to a ratchet which is utilized as an automatic counter of the periodic time intervals. The rachet preferably contains twenty teeth about its periphery for providing twenty time interval counts for one revolution of the rachet. The rachet also includes a cam lever mounted thereon which is adapted to trigger a locking mechanism for opening a cover to the case. The cam lever functions to unlock the case after each revolution of the rachet, which is twenty time intervals, to enable the compartment to receive a new supply of cigarettes. The slider is also integrally connected to a gear rack which is longitudinally slidable to engage an input gear of the timing mechanism for winding purposes. A time sequence cam is mounted adjacent the gear rack to adjustably limit the travel of the gear rack, thereby limiting the amount the timing mechanism can be wound.

3,722,743

CONVEYOR MECHANISM FOR ARTICLE DISPENSING APPARATUS

Richard C. Atchley, Charlotte, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed March 10, 1971, Ser. No. 122,761
Int. Cl. B65g *1/12*
U.S. Cl. 221—77 **18 Claims**



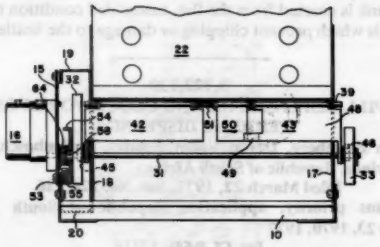
Apparatus is disclosed which is adapted for use primarily in vending machines of the coin-operated type. A conveying mechanism is provided which may be used in a variety of different styles of vending machines. The conveying mechanism includes extensible and contractable endless rails on which an endless link conveyor is mounted for travel. Each link of the conveyor is an extruded element having a tray or divider projecting from one surface. Male and female hinge portions project from the other surface at edges thereof for hingedly connecting adjacent links, and the hinge connections are arranged to travel on the rails. Sprockets are mounted adjacent to the rails, and the hinge connections are in mesh with the sprockets so that the turning of one of the sprockets will cause the conveying mechanism to travel on the rails. Various arrangements for loading and ejecting articles to and from the link conveyor are also disclosed.

3,722,744

SPLIT VEND GATE MECHANISM

Harry R. Payne, Chattanooga, Tenn., assignor to Cavalier Corporation, Chattanooga, Ind.

Filed March 8, 1972, Ser. No. 232,779
Int. Cl. B65g *59/06*
U.S. Cl. 221—129 **10 Claims**



A vend mechanism for back-to-back staggered stacks of cans or for a single staggered stack of bottles has opposed

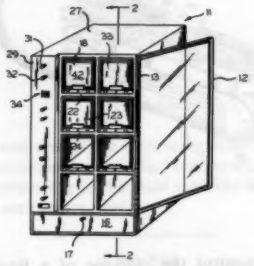
vend gates for each stack. Each pair of opposed vend gates is actuated by a rotary cam and these cams are rotated by a single shaft which extends beneath the stacks of cans or bottles and acts to support the lowest can or bottle in the stack against the adjacent gate. An electric motor rotates that shaft in 90° increments for back-to-back staggered stacks of cans and rotates the shaft through 180° increments for a single staggered stack of bottles. A limit switch in the motor circuit is actuated by adjustable tabs rotated by the shaft to obtain the desired increments of rotation. One of the pairs of end gates is provided with a releasable portion when bottles are to be vended to prevent the bottle cap from sticking against the adjacent vend gate and blocking the vend mechanism.

3,722,745

MODULAR VENDING MACHINE HAVING TRAP-DOOR EJECTION MECHANISM

Peter James Gushi, 10400 South Larami, Oak Lawn, and Robert B. Kyts, 880 North Lake Shore Drive, Chicago, both of Ill.

Filed Nov. 2, 1970, Ser. No. 86,046
Int. Cl. G07f 11/10
U.S. Cl. 221—130 **15 Claims**



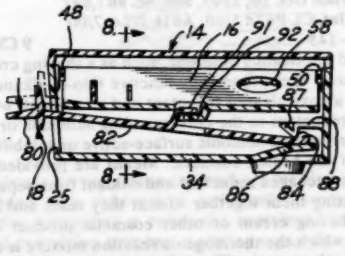
A modular vending machine featuring a plurality of independent compartments. Each compartment is amenable to receiving a module containing a plurality of packaged items, such as cassettes, for sale. The modules plug into the machine compartments and contain the apparatus necessary to dispense an item responsive to selection and payment by a vendee. Means are provided to assure that the packaged items are individually dispensed. A glass door front enables the purchaser to view the contents of the machine.

3,722,746

CIGARETTE CONTAINER AND DISPENSER

Garry Kleves, Winnipeg 13, Manitoba, Canada, assignor to K-Tel International, Inc.

Filed Dec. 17, 1971, Ser. No. 209,037
Int. Cl. A24f 15/02
U.S. Cl. 221—205 **11 Claims**



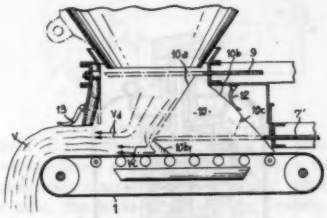
A cigarette container and dispenser which includes a housing having a tray for supporting cigarettes pivoted therein. An actuator for moving the tray is pivoted in the housing transverse to the tray. Guide means are provided in the housing for cooperating with the tray for moving cigarettes one at a time from the tray to a support trough. Tilt means adjacent an end of the support trough cooperate with the support trough for tilting a cigarette so that it can readily be grasped by a user. Divider means are detachably secured to the tray to accommodate cigarette or like objects of different lengths. The housing is supported in tripod fashion so as to better adapt to non-planar surfaces.

3,722,747

SILO DISCHARGE CONTROL

Georges Petit, 10, avenue de Salonique, Paris, France

Continuation of Ser. No. 842,545, July 17, 1969, abandoned. This application Nov. 19, 1971, Ser. No. 200,634
Claims priority, application France, July 24, 1968, 68160406
Int. Cl. B65g 67/56
U.S. Cl. 222—56 **9 Claims**



This specification discloses a silo suitable for granulated or powder form materials. The silo of the invention comprises a fixed shaft, at least one transfer assembly situated below said shaft and an extractor disposed beneath said transfer assembly. The silo shaft has a convergent hopper in its lower portion and there is an outlet opening in the hopper which provides for free flow of material.

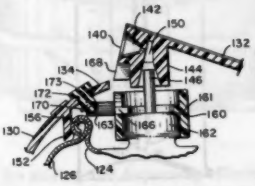
At least one decompression hopper is situated in the transfer assembly and is elastically suspended so as to be displaceable in all directions relative to the silo shaft and the extractor. In this way, products leaving the silo form a constantly renewed slope at the rear end of the active part of said extractor.

3,722,748

CHILD-SAFE ACTUATOR-OVERCAP

Alfred W. Wakeman, Durham, and Paul M. Kotuby, Naugatuck, both of Conn., assignors to The Risdon Manufacturing Company, Naugatuck, Conn.

Continuation of Ser. No. 226,604, Feb. 15, 1972, abandoned. This application March 23, 1972, Ser. No. 237,330
Int. Cl. B67d 5/22
U.S. Cl. 222—48 **12 Claims**



A closure assembly is disclosed for the valved end of an aerosol container, incorporating an actuator-overcap member

and a cooperating ring or collar to render the actuator inoperative in respect to the dispensing valve unless a specific relationship between the actuator-overcap and ring member is first established by rotating one relative to the other. Each member is provided with a keying element which, when in axial registry with the other, interfit to permit depression of the actuator, and each member is provided with means enabling an adult to visually recognize such registry as indicative of operative condition of the aerosol container while minimizing the change of a small child so recognizing or achieving such condition. In the preferred embodiment, registration can be effected only visually; no mechanical indication of registration is provided.

3,722,749

AEROSOL SPRAY CONTAINER

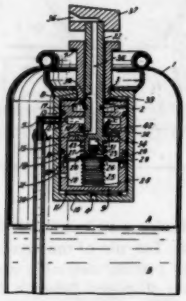
Mitsuo Ishida, No. 9 Ageba-cho, Shinjuku-ku, Tokyo, Japan

Filed Dec. 30, 1971, Ser. No. 213,991

Claims priority, application Japan, Dec. 31, 1970, 45/129662

Int. Cl. B67d *5/08*

U.S. Cl. 222—61 **4 Claims**



An aerosol spray container has a spray valve construction which will intermittently spray measured amounts of the container contents in an automatic sequence, but which can also be operated manually, when it is desired to override the automatic operation.

3,722,750

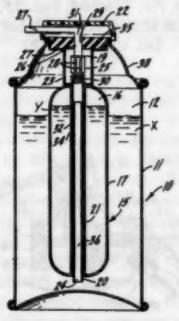
AEROSOL CAN CONSTRUCTION

Charles F. Fox, Jr., 14738 South Clark Street, Dolton, Ill.

Filed Sept. 2, 1970, Ser. No. 68,993

Int. Cl. B65d *35/22*

U.S. Cl. 222—94 **7 Claims**



An aerosol dispenser comprising a sealed container containing a plurality of compartments, each possessing a different dispensable material. A dip tube positioned in the container having radial inlet openings extending through it. Rotation of the dip tube about its axis aligns the inlet openings with ports which communicate with the compartments so a selected combination of materials can be dispensed.

3,722,751

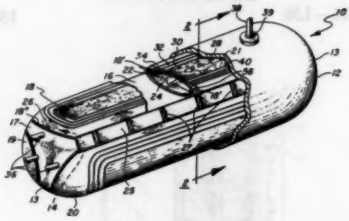
CONTROL FOLD LIQUID EXPULSION BLADDER

Natale R. Bisciglia, Northridge, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 1, 1970, Ser. No. 77,156

Int. Cl. B65d *35/22*

U.S. Cl. 222—94 **9 Claims**



A means to control the collapse of a liquid expulsion bladder is disclosed which comprises one or more bladder lobes identical in cross-section having a variable wall thickness. When external gas pressure is applied to the bladder it begins to collapse in the thin wall section, at its center, propagating towards the thicker side walls and ends. The bladder sequentially collapses towards a concave support structure with a contour matching the bladder shape, during the last stage of liquid expulsion, expulsion is complete with the bladder conforming to the concave surface of the structure free of double folds and tears.

3,722,752

SELF-HEATING COSMETIC

Divaker B. Kenkare, North Plainfield, and Durland K. Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,897

Int. Cl. B67d *5/60;* **A61k** *7/14, 7/00*

U.S. Cl. 222—145 **9 Claims**

A packaged self-heating cosmetic, such as a shaving cream, includes separate thermogenically reactive thio-di-alkanol or thio-di-lower alkoxy alkanol reductant and an oxidant, which converts the reductant to the corresponding sulfoxide or sulfone, which serves as a nonionic surface-active or solubilizing constituent of the heated cosmetic. Means are provided for dispensing the packaged reductant and oxidant from separate zones and mixing them together so that they react and heat pressurized shaving cream or other cosmetic product constituents with which the thermogenic reaction mixture is contacted. The reducing agent employed is preferably 2,2'-thiodiethanol or thiodiethoxyethanol and the oxidizing agent is aqueous hydrogen peroxide.

3,722,753

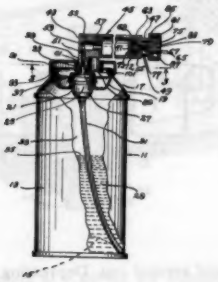
DISPENSING ATTACHMENT FOR PRESSURIZED CONTAINERS

Gilbert de Wayne Miles, Ossining, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 487,968, Aug. 31, 1965, which is a continuation of Ser. No. 325,209, Nov. 15, 1963, which is a continuation-in-part of Ser. No. 139,274, Sept. 19, 1961. This application Dec. 1, 1966, Ser. No. 611,499

Int. Cl. B67d 5/62

U.S. Cl. 222—146 HA 11 Claims



A process and device for dispensing fluid material from a pressurized container at a modified temperature and including means for transferring to the fluid material heat from an exterior source such as hot water.

3,722,754

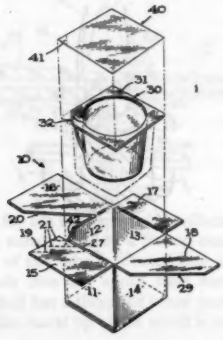
PLASTIC CONTAINER-DISPENSER WITH OUTER CARTON CONTAINER

Glenn E. Struble, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed April 14, 1971, Ser. No. 133,979

Int. Cl. B67d 5/06

U.S. Cl. 222—183 7 Claims



A liquor portion dispensing-package for air line service use provided with light-weight and easily disposable characteristics comprising a composite container having an inner liquid containing member, a sealing cover thereover and an outer folding carton member. The inner container member being a semi-rigid plastic cup and the sealing cover being of flexible sheet material.

3,722,755

APPARATUS FOR AUTOMATICALLY FILLING A PRE-DETERMINED AMOUNT OF POWDERED GRAIN SUBSTANCE

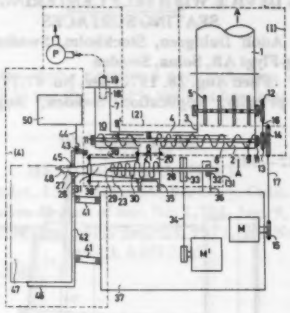
Shigeo Nakashima, 7-7, Koaza Tenjinmori, Oaza Morimoto, Mukomachi, Otokuni-gun, Kyoto-fu, Japan

Filed Sept. 11, 1970, Ser. No. 71,506

Claims priority, application Japan, Jan. 31, 1970, 45/8632; Nov. 15, 1969, 44/91507

Int. Cl. B65d 83/06

U.S. Cl. 222—193 5 Claims



Apparatus for automatically filling a pre-determined amount of powdered granular material into a bag. The apparatus comprises a screw feeder provided within a tubular conveyor case, the walls of which are flexible. A smooth transfer of powder is effected by vibrating the walls of the conveyor case. In addition, to transfer the substance from the conveyor a pulsed compressed air stream is jetted at the substance being transferred near the other end of the conveyor case. Within the conveyor case are provided a mixing chamber, and a supply tube connected to measuring apparatus via a flexible tube, so that when a pre-determined amount of powdered material is filled in the bag, the filling operation automatically comes to a stop.

3,722,756

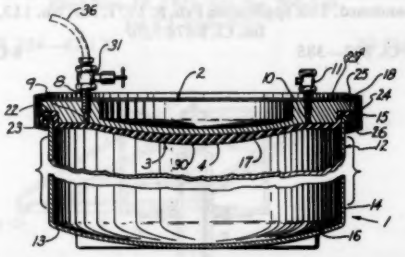
METHOD AND APPARATUS FOR STORING AND DISPENSING EFFERVESCENT BEVERAGES

Roy A. Cramer, Jr., c/o Roycraft Industries, 8100 Paseo, Kansas City, Mo.

Filed July 19, 1971, Ser. No. 163,885

Int. Cl. B65d 37/00

U.S. Cl. 222—212 9 Claims



Apparatus for storing and dispensing effervescent beverages such as sparkling or effervescent wines and beverages for human consumption and the method of handling same. The apparatus includes a container having a head member engaged by peripheral edge portions of a resilient and distensible

bladder having a web portion in engagement with one surface of the head member until a gas under a selected super atmospheric pressure is forced between the head member and the resilient member to expand same to receive a selected liquid under a pressure to fill the space in the bladder and expel the gas through a valve. The liquid is maintained under super atmospheric pressure during storage by the bladder and also during dispensing of the contents, a glass at a time, by opening a dispensing valve or spigot.

3,722,757

PUMPING DEVICE WITH SELF CENTERING SPHERICAL SEATING SURFACES

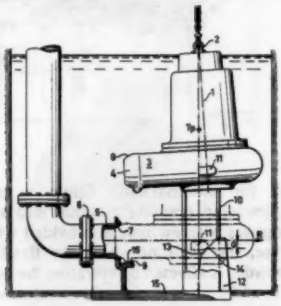
Jens Karl Adolf Dahlgren, Stockholm, Sweden, assignor to Stenberg-Flygt AB, Solna, Sweden

Filed Aug. 28, 1970, Ser. No. 67,719

Claims priority, application Sweden, Aug. 29, 1969, 12018/69

Int. Cl. B67d 5/40

U.S. Cl. 222—385 **3 Claims**



A pump unit immersible in the liquid of a well, comprising a liquidtight motor, a pump housing with an outlet connection and guiding means which, on lowering of the pump unit, guide the outlet connection into the vicinity of a fixed coupling unit of the outlet pipe. The pump unit having a seating while the outlet connection has a tapered aperture fitting thereto, so that the connection, after the unit has been essentially lowered, can be brought up against the coupling unit, into sealing engagement with the seating, essentially in the axial direction of the coupling unit. The seating surfaces being spherical to allow for slight misalignment.

3,722,758

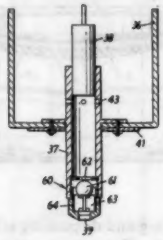
APPARATUS FOR DEPOSITING VISCOUS LIQUIDS

Christopher John Lewis Warren, 50, The Ridgeway, and John William Milross, 6, Tolpits Lane, both of Watford, England

Continuation-in-part of Ser. No. 798,050, Feb. 10, 1969, abandoned. This application Feb. 8, 1971, Ser. No. 113,381

Int. Cl. B67d 5/50

U.S. Cl. 222—385 **8 Claims**



Toffee dispensing apparatus comprises a pump plunger reciprocatable within a cylinder, the clearance between the plunger and cylinder being such that the liquid provides the sole sealing medium between the plunger and cylinder, and a discharge valve from the cylinder in which a valve member is movable vertically to seal a discharge aperture from the cylinder and is drawn against the aperture by suction, there being no external means biasing the valve member against the aperture.

3,722,759

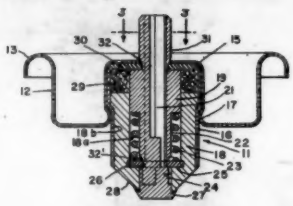
EXPLOSION PROOF AEROSOL CAN

Joseph P. Rodden, 60 Jarrett Lane, Hatboro, Pa.

Filed Nov. 17, 1971, Ser. No. 199,501

Int. Cl. B65d 83/14

U.S. Cl. 222—396 **15 Claims**



Explosionproof aerosol can. Depressing spray head against coil spring surrounding delivery tube in normal operation moves discharge port in said tube below surrounding valve body, permitting discharge of container product. Excess pressure acts on large area annular face of surrounding valve body and on coil spring to compress yieldingly resilient composition in valve housing, thus moving valve body so as to expose discharge port.

3,722,760

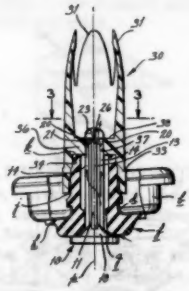
DISPENSING VALVE HAVING POSITIVE TILT STEM

Richard C. Hug, St. Louis, Mo., assignor to Clayton Corporation, St. Louis, Mo.

Filed Dec. 23, 1971, Ser. No. 211,593

Int. Cl. B65d 83/14

U.S. Cl. 222—402.22 **4 Claims**

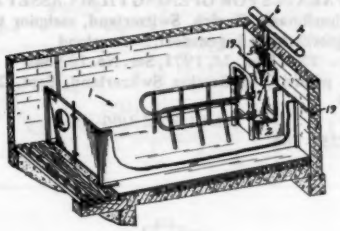


A dispensing valve of the type having a tubular elastic seal, utilizes a molded solid dispensing stem seated within it, and an external nozzle. Four ribs on the stem, fitted in a bore of the nozzle, assure tilt movement of the stem equal to that of the actuator. Two opposite ribs terminate within the bore, in end surfaces which permit cross-flow, into the base of an outflow groove which extends inward between the intermediate ribs. On the projecting ends of these are retention portions, shaped like half acorns, which flex into the groove to permit snap assembly.

3,722,761
DEVICE FOR TRANSPORTING PRE-MEASURED AMOUNTS OF FEED

Paul Icking, Borkenwirthe 82, Borken, and Hubert Ridder, Am Schwanenhof 27, Raesfeld, both of Germany

Filed May 3, 1971, Ser. No. 139,623
Claims priority, application Germany, June 24, 1970, P 20 31 056.9; Feb. 10, 1971, P 21 06 333.2
Int. Cl. A01k *5/00*
U.S. Cl. 222—409 **11 Claims**

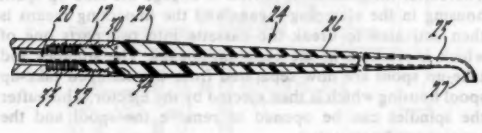


The invention refers to a device for transporting premeasured amounts of granular feed to feeding stations by means of a horizontal feed transport tube above the feeding station and a drop-chute connected to the feed transport tube, whereby premeasured amounts are conveyed to the feeding station via the drop-chute.

3,722,762
OILER SPOUT

Basil B. Mann, West Islip, N.Y., assignor to Century Tool Company, Inc., Penndel, Pa.

Filed Oct. 28, 1970, Ser. No. 84,818
Int. Cl. B65d *25/40*
U.S. Cl. 222—568 **1 Claim**



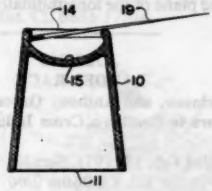
An oiler spout for use in electrical installations comprising a metal inner tube surrounded by a plastic outer shell. The exposed outer end of the tube is formed into a curved tip. The inner end extends into the spout base but not in contact therewith. The shell has a threaded inner portion mounted on the base so that the metal tip of the spout is insulated from the oiler body.

3,722,763
SEWING THIMBLE

William Heinz, 2425 Bowness Rd., N.W., Calgary 42, Alberta, Canada

Filed April 22, 1971, Ser. No. 136,330
Int. Cl. A41h *31/00*
U.S. Cl. 223—101 **1 Claim**

A sewing thimble is provided with an inwardly formed dome on the closed end and a small annular inturned rim or flange. The rim prevents a needle from slipping out when applying

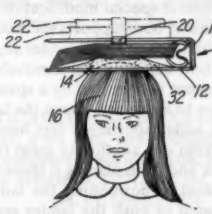


pressure and the dome permits a person having a relatively long finger-nail to use the thimble without breaking their nail.

3,722,764
HEAD LOAD BALANCER

John E. Kallander, 1316 Milvia St., Berkeley, Calif.

Continuation-in-part of Ser. No. 1,704, Jan. 9, 1970, abandoned. This application June 22, 1971, Ser. No. 155,425
Int. Cl. A45f *3/00*
U.S. Cl. 224—5 R **5 Claims**

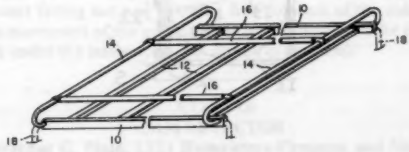


A head load balancer to be worn on the top of the head and including a load support having head engaging means automatically conforming fairly rigidly to the shape of the top of the wearer's head without any mechanical internal mechanism adjustment. The head engaging means comprises a plurality of circumferentially spaced elements engageable with the top of the wearer's head at circumferentially spaced points pivotally moveable independently of each other and yet flexibly interconnected and having substantial relative movement to each other so as to automatically conform to the wearer's head.

3,722,765
CAR TOP RACK

Kenneth W. Binding, Woburn, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Nov. 19, 1971, Ser. No. 200,429
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 E **20 Claims**



A rack for the top of the vehicle comprising longitudinally spaced parallel bars containing transversely spaced holes, spaced parallel bars situated between the longitudinally spaced bars non-rotatably received in said holes, spaced parallel rails having reversely bent ends mounted at opposite sides of the longitudinally spaced bars with the bent ends sprung into the holes in said longitudinally spaced bars, said rails

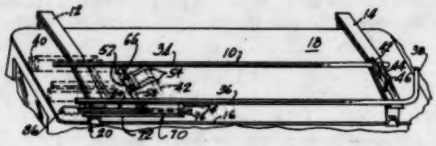
being supported by said bent ends above the plane of the longitudinally extending bars and being rotatable into the plane of the longitudinally extending bars, and tie rods connecting the rails operable to hold them erect or to hollow them to be rotated into the plane of the longitudinally extending bars.

3,722,766

LADDER RACK

Wade H. Barrineau, and Anthony Osborne, both of Atlanta, Ga., assignors to Southern Cross Industries, Inc., Atlanta, Ga.

Filed Feb. 12, 1971, Ser. No. 114,771
Int. Cl. B60m 9/00
U.S. Cl. 224—42.1 F 13 Claims



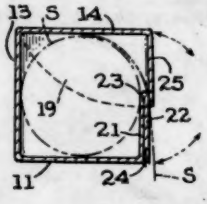
Capable of handling 24 ft. or 28 ft. extension ladders on top of a telephone truck the present ladder rack is easily assembled and installed without special modification of the vehicle by attachment of a pair of bow supports secured to the vehicle rain gutter on each side. Longitudinal ladder support members are attached to the bow supports and a movable ladder rung finger catch arrangement is operated by a spring steel handle which latches in place to move and clamp the ladder tightly in place on the rack. Ladder abuttment feet have curved faces which are reversed from one another to assist in removing the ladder from the truck and from placing it thereon while standing alongside. To assist in positioning the ladder the spring steel handle is operated to push the ladder rearward against the fixed feet by means of the rung engagement fingers and then the handle is relatively shiftable to be spring biased into a notch, or without the ladder the fingers are retracted against the vehicle top spring tensioned by the handle.

3,722,767

SAFETY CUTTER-EDGE BOX

Glenn E. Struble, Fairfield, Ohio, assignor to Diamond International Corporation, New York, N.Y.

Filed April 14, 1971, Ser. No. 133,980
Int. Cl. B26f 3/02
U.S. Cl. 225—49 4 Claims



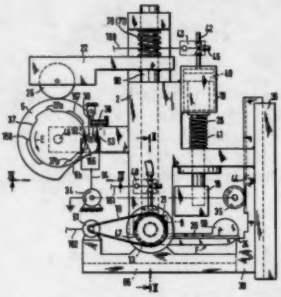
Cutter edge box for containing and dispensing web sheet material such as waxed paper, plastic film, metal foil and the like while in roll form. The box being provided with a cutter edge to facilitate severing off a web portion of said sheet material after a desired length thereof has been withdrawn from the box. The cutter edge being so arranged on said box that in the original package said cutter edge is in a shielded or unexposed position whereby safety is afforded to anyone or anything coming into contact with the box and after the box is opened by the consumer the cutter edge is freely pivotable to a cutting position and back to the shielded position. The box being further provided with lid structure for clamping the sheet material against the support panel for the cutter edge during use thereof.

3,722,768

APPARATUS FOR OPENING FILM CASSETTES

Oskar Schnellmann, Zurich, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Sept. 24, 1971, Ser. No. 183,340
Claims priority, application Switzerland, Sept. 25, 1970, 14267/70
Int. Cl. B26f 3/00
U.S. Cl. 225—105 6 Claims



A device for opening film cassettes which have a housing formed with two spool chambers and a web therebetween, comprising, two stub spindles, a clamping means and ejector combined therewith, and impacting means, all movable relative to one another by drive means. The drive means are controlled first to move the two stub spindles into axial alignment in clamping position on a take-up spool of a film cassette. Thereafter the cassette is moved to engage the take-up spool housing in the clamping means and the impacting means is then activated to break the cassette into two parts one of which is retained in the clamping means. The spindles and take-up spool are now separated from the clamped take-up spool housing which is then ejected by the ejector. Thereafter the spindles can be opened to remove the spool and the process can be repeated.

3,722,769

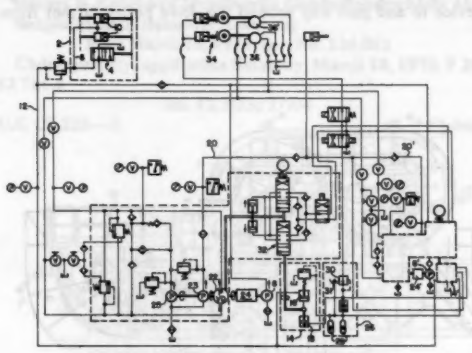
TENSION CONTROL SYSTEM

Everett Lloyd Aplet, Everett, and Thomas J. Reynolds, Seattle, both of Wash., assignors to Western Gear Corporation, Seattle, Wash.

Filed Feb. 11, 1971, Ser. No. 114,461
Int. Cl. B65h 23/22
U.S. Cl. 226—25 10 Claims

A tension control system for use in conjunction with an apparatus for feeding an elongated object such as a pipe or wire including a variable speed motor means for controlling the speed at which the object is being fed, and a means for preselecting the range of tension to which the object may be

safely subjected. The system further includes a means for accurately measuring the tension to which the object is subjected and varying the speed of the feed in accord therewith to maintain the tension within the predetermined limits.

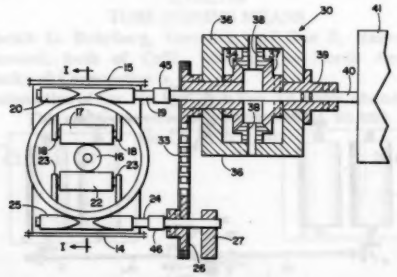


3,722,770

METHOD AND APPARATUS FOR CONTROLLING THE PATH OF AN ELONGATE ARTICLE

Jean Bouffard, Lachine, Quebec, and Yvon Onil Dionne, Chateauguay Center, Quebec, both of Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Dec. 6, 1971, Ser. No. 204,938
Int. Cl. B65h *25/02*
U.S. Cl. 226—45 **2 Claims**



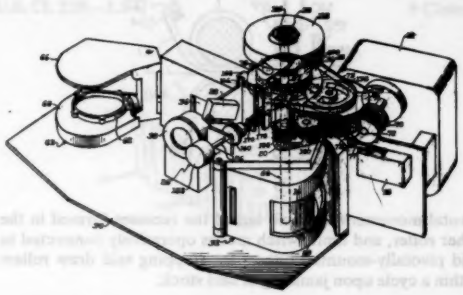
Apparatus and method for controlling the passage of a cable, or similar elongated article, through a treatment zone. Sensing devices bear on opposite sides of the article and move with the article when the article departs from the desired path. The detectors are connected in opposition so that if the detectors move in opposite directions, as when the diameter or thickness, of the article changes no output occurs. An output only occurs when the detectors move in unison in the same direction, as when the article departs from the desired path. Thus the apparatus is insensitive to cable diameter and does not require recalibrating for changes in size of cable treated.

3,722,771

FILM STRIP PROJECTOR

Robert E. Petterec, Lindenhurst, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 16, 1971, Ser. No. 199,223
Int. Cl. B65h *17/04*
U.S. Cl. 226—51 **5 Claims**



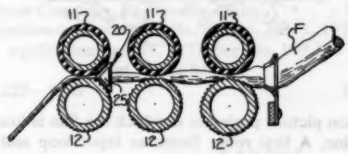
A film strip projector having a powered drive means selectively operable to feed the film by an intermittent drive in the forward projection direction and operable to rewind the film by a continuous drive at a rate faster than the intermittent drive.

3,722,772

MAGNETICALLY POSITIONED GUIDE MEANS

Thad T. Flowers, Fort Mill, and William I. Stuart, Chester, both of S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.

Filed March 29, 1971, Ser. No. 128,960
Int. Cl. B65h *23/04*
U.S. Cl. 226—196 **3 Claims**



Guide means of a predetermined shape for being positioned in advance of and substantially in the nip of a pair of juxtaposed rotating feed rolls, e.g., drafting rolls of a textile drafting apparatus, for receiving a strand of material and guiding the strand of material through the rolls. At least one of the rolls has at least an outside surface of magnetically conductive material. The guide means has magnetic means associated therewith of a predetermined magnetic strength for attraction to the magnetically conductive surface of the roll for holding the guide means in position in the nip of the pair of rolls to prevent falling out and allowing free rotation of the rolls and free movement of the guide means longitudinally of the pair of rolls under the influence of the strand of material.

3,722,773

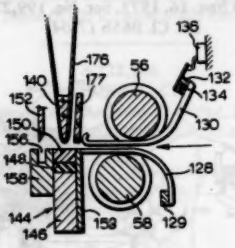
JAM DETECTOR

Geerardus G. Plate, 1321 Humphreys Crescent, and Nicolaas Van Hattem, 1168 Homewood Drive, both of Burlington, Ontario, Canada

Division of Ser. No. 888,498, Dec. 29, 1969, Pat. No. 3,673,879. This application June 19, 1972, Ser. No. 263,923
Int. Cl. B65h *25/00*
U.S. Cl. 226—25 **4 Claims**

A jam detector for use in bag-making machines having a pair of opposed draw rollers with circumferential recesses

formed therein comprising a plurality of stationary fingers mounted for alignment with the recesses formed in one roller for guiding stock material, a plurality of fingers mounted for



pivotal movement into and out of the recesses formed in the other roller, and limit switch means operatively connected to said pivotally-mounted fingers for stopping said draw rollers within a cycle upon jamming of said stock.

3,722,774

MOTION PICTURE PROJECTOR MEANS

Abraham Scheinderman, 2164 Regent Court No., Westbury; Karl Rudzitis, 16 Blanchard Street, West Babylon; Arthur Brandsdorfer, 8 Bartel Place, Huntington, and George Wechsler, 1122 Harrison Street, North Bellmore, all of N.Y.

Filed Dec. 30, 1971, Ser. No. 214,087

Int. Cl. G03b *1/22*

U.S. Cl. 226—62 **4 Claims**

A motion picture projector in which the film is loaded in a straight line. A first roller forms an input loop and is then retracted. Second and third rollers wrap the film about the sound pick-up. Input and output sprockets are automatically de-clutched so that the sprockets are freely rotatable during the loop forming. In projection mode, the sprockets are driven and a claw device is engaged with automatic framing. Instantaneous stopping to view a single frame in fully framed position is provided by means for disengaging the claw from the film without stopping its linear oscillating motion, and at the same time de-clutching the sprockets. Control means are provided for simultaneously re-engaging the sprockets and re-engaging the film claw in the film without losing the framing.

3,722,775

EQUIPMENT FOR LAYING OR RECOVERING SUBMARINE CABLES

Marcello Sarracino, Milan; Antonio Ferrintino, Monza, and Andrea Borroni, Carimate, all of Italy, assignors to Industries Pirelli Societa per Azioni, Milan, Italy

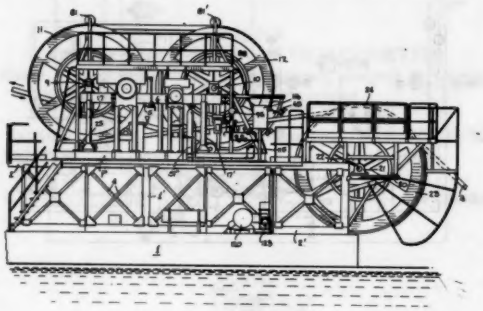
Filed Feb. 4, 1972, Ser. No. 223,687

Claims priority, application Italy, Feb. 12, 1971, 20455 A/71

Int. Cl. B65h *17/22*

U.S. Cl. 226—100 **24 Claims**

Apparatus for laying or recovering a submarine cable in which the cable is fed to or from a storage device by a pair of drive pulleys intermediate the storage device and a pulley for guiding the cable into the water, such pulleys rotating in planes at an angle to each other, having braking and hydraulic motor units for braking or driving them and being mounted on a frame permitted slight oscillating movement in the direction of the cable laying. Pressure wheels maintain the cable in the driving pulley races, and the cable extends from the storage device to and part way around the drive pulley farther from



the storage device, then to and part way around the other drive pulley and then to the guide pulley. The braking units are water cooled and air operated and a hydraulic system controls the hydraulic motors. A dynamometer measures the pulley supporting frame movement, and instrumentation for indicating cable tension, speed and movement and braking pressure is included.

3,722,776

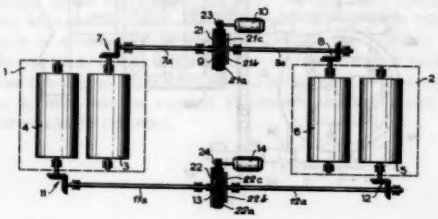
ROLL SYSTEM FOR TENSIONING ELONGATED WORK PIECES

Oskar Noe, Mulheim/Ruhr, Germany, assignor to Fa. BWG Bergwerk-und Walzwerk-Maschinebau G.m.b.H., Duisburg, Germany

Filed May 3, 1971, Ser. No. 139,575

Int. Cl. B65h *23/08*

U.S. Cl. 226—195 **8 Claims**

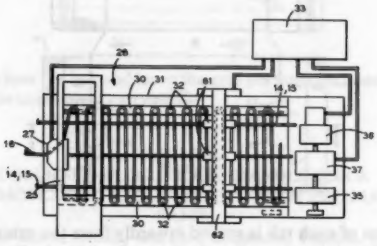


A roll system for tensioning elongated workpieces such as metal bands or webs of other material, wire and the like, comprises a pair of roll supports or stands, each provided with a plurality of rolls in mirror-symmetrical relationship with the rolls of the other stand. The mirror-symmetrical rolls are interconnected by a differential transmission, e.g. a planetary gear arrangement which is coupled with a respective hydraulic motor receiving fluid from a variable-capacity hydraulic pump common to all of the motors for establishing the necessary torque at the rolls.

3,722,777
APPARATUS FOR MAKING ELECTRICAL HEATING MATS

Gerhard Ziemek, 3 Hannover; Friedrich Schatz, 3012 Langenhagen, and Karoly Aust, 3 Hannover, all of Germany, assignors to Kabel-und Metallwerke Gutehoffnungschutte Aktiengesellschaft, Hannover, Germany

Filed March 15, 1971, Ser. No. 124,051
Claims priority, application Germany, March 18, 1970, P 20 12 766.6
Int. Cl. B23c *37/04*
U.S. Cl. 228—4 7 Claims



Apparatus for the continuous production of electrical heating mats constituted of a continuous linear electrical heating element looped to form parallel portions together with tapes extending longitudinally of the looped portions of the heating element and arranged to lock the transverse portions of the heating element in spaced relation to each other. Such apparatus includes a looping mechanism for continuously looping the linear heating element as it is fed to the looping mechanism, together with means for controlling the looping mechanism to render the successive loops taut, and means for feeding a pair of tapes longitudinally of the looped element with the tapes on opposite sides thereof and including means for crimping one of the tapes at spaced intervals to receive a portion of the heating element therein and means for securing the tape portions between successive loops of heating element, together.

3,722,778
TUBE JOINING MEANS

Roderick G. Rohrberg, Torrance, and Don E. Harvey, Inglewood, both of Calif., assignors to North American Rockwell Corporation

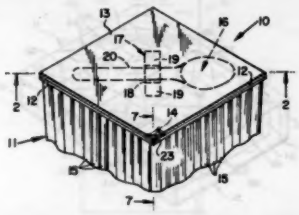
Continuation of Ser. No. 707,819, Feb. 23, 1968, abandoned. This application Dec. 14, 1970, Ser. No. 98,089
Int. Cl. B23k *1/20*
U.S. Cl. 228—13 20 Claims

A portable carriage adapted to be mounted on a tubular workpiece is used to perform cutting operations followed by in place welding operations on such workpiece using two subassemblies interchangeably mounted on the carriage, one for cutting and one for welding. The carriage is rotatable around the stationary workpiece or may be held stationary while the workpiece rotates. After preliminary trimming, fusion welding is progressively accomplished in a circular path to join the abutting ends of the workpiece components.

3,722,779
COMBINATION FOOD CONTAINER AND IMPLEMENT FOR EXTRACTING THE CONTENTS

Henry M. Chang, Bronx, N.Y., assignor to First Dynamics, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 815,935, April 14, 1969, Pat. No. 3,623,632. This application Oct. 14, 1970, Ser. No. 80,713
Int. Cl. B65d *77/30*
U.S. Cl. 229—1.5 C 9 Claims

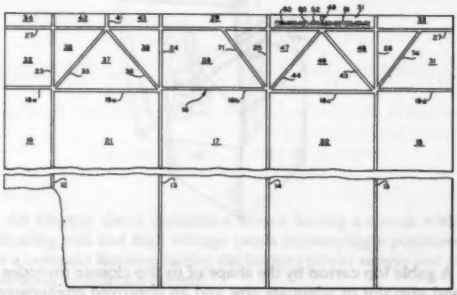


The food container includes a container body having its upper circumferential edge provided with a continuous flange. An implement, for example, a spoon, is removably secured against the underside of the container cover and is preferably positioned along a maximum dimension of the cover. The cover is sealed to the body flange except for a graspable tip or tab which is so positioned that, when it is torn back it tears toward the center of the cover in a direction at right angles to the said maximum dimension and thus maintains the implement parallel with the container bottom and prevents it from being tilted into the container contents.

3,722,780
GABLE TOPPED CONTAINER AND PAPERBOARD BLANK

George E. MacEwen, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 51,495, July 1, 1970. This application Jan. 25, 1971, Ser. No. 109,177
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 G 13 Claims



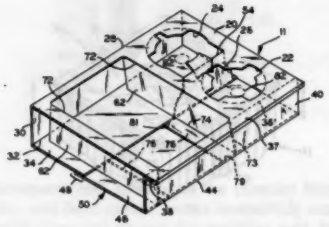
A gable topped container and a paperboard blank for forming the containers constructed with ridge panels that are a substantially common width and with an end closure member having an interrupted, weakened line of severance at an elevation higher than the lowermost edges of the ridge panels with the uppermost edges of the roof panels and end closure member being at a substantially common elevation. The weakened line of severance is coated with a material being of a type for preventing sealing of the ridge panels to the portion of the end closure member covered by said material coating.

3,722,781

FOLDABLE CARRY-OUT SERVING TRAY

William H. Page, Toledo, Ohio, and George A. Spillson, Monroe, Mich., assignors to Consolidated Packaging Corporation, Chicago, Ill.

Filed June 28, 1971, Ser. No. 157,098
Int. Cl. B65d *5/48*
U.S. Cl. 229—28 **9 Claims**



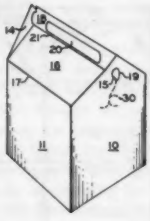
A collapsible tray foldable from one sheet of material such as paperboard having two partly overlapping bottom panel sections, opposite side panels and a top panel which is cut out to form cup retaining apertures and a large rectangular sandwich retaining aperture; which cut-outs provide first hinged struts parallel to the side panels and having end hinged flaps connected between the overlapping bottom panel sections, and second hinged struts transverse to the side panels having end hinged flaps which may engage notches which lock in the edge of the upper overlapping bottom panel section, and one of whose ends abuts one side panel, for locking the tray in its erected position. One side edge of this one side panel also may have a reinforcing flange therealong to prevent bending of the tray.

3,722,782

FOLDING CARTON

Stafford D. Collie, Glen Elly,, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 5, 1970, Ser. No. 78,120
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 R **9 Claims**



A gable top carton by the shape of its top closure provides a hand grip slot of adequate size and an improved engagement of top closure locking structure. The carton can be readily collapsed and erected.

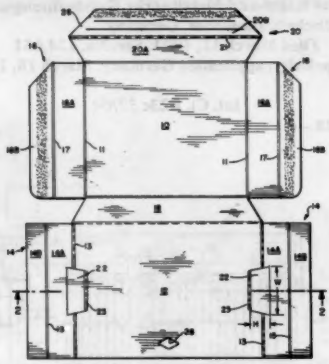
3,722,783

CARTON

Arthur Rous, Englewood, N.J., assignor to Grand City Container Corporation, North Bergen, N.J.

Filed March 27, 1972, Ser. No. 238,634
Int. Cl. B65d *5/02*
U.S. Cl. 229—40 **8 Claims**

A carton for packaging an article is formed from a single piece blank and includes a bottom wall and two inner end flaps which are hingedly connected to the bottom wall and which are oblique with respect to the bottom wall. A pair of tabs are formed in the bottom wall of the carton. The tabs are hingedly connected to the bottom wall such that the axis of



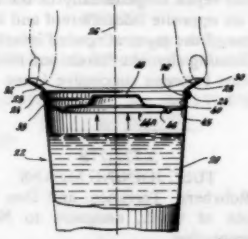
rotation of each tab is spaced inwardly from the axis of rotation of each inner end flap. In the preferred embodiment, the tab is normally positioned perpendicular to the bottom wall of the carton. In an alternate embodiment, the tab forms an angle with the bottom wall of the carton.

3,722,784

CONTAINER CLOSURE

Paul W. Harper, 125 Lenore Ln., Centereach, N.Y.

Filed Jan. 8, 1971, Ser. No. 104,902
Int. Cl. B65d *43/00, 5/64*
U.S. Cl. 229—43 **25 Claims**



A closure adapted to seal a container while being easily removable therefrom. Sealing means is provided for substantially hermetically sealing the container from its external environment. The sealing means is arranged to mate with the inside walls of the container and maintain wedging and sealing contact therewith. Closure releasing or lever means is connected to the sealing means for providing sufficient mechanical advantage to break the seal between the sealing means and the container upon the application of sufficient downward force to the lever means, whereby the closure is readily removable from the container.

3,722,785

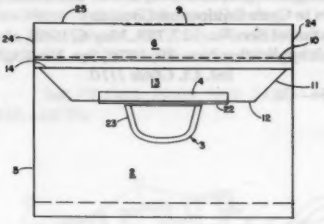
RE-USABLE HANDLE BAG

Samuel Joseph Rivman, White Plains, N.Y., assignor to W. R. Grace & Co., Duncan, S.C.

Filed Oct. 21, 1971, Ser. No. 191,308
Int. Cl. B65d *33/06, 33/16*
U.S. Cl. 229—54 R **7 Claims**

The re-usable handle bag has both a closure flap and a tapered handle flap extending from opposed sides of the

mouth of the bag. A handle is attached to the handle flap and can be inserted through a receiving aperture in the closure



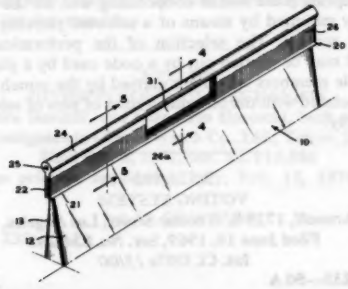
flap to close the bag and leave the grip portion of a handle exposed for convenient carrying.

3,722,786

COMBINED CLOSURE AND HANDLE FOR A THERMOPLASTIC BAG AND METHOD OF PRODUCING SAME

James B. Honn, Arcola, and Paul E. Jacobs, Tuscola, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed April 6, 1971, Ser. No. 131,615
Int. Cl. B65d *33/06, 33/10*
U.S. Cl. 229—54 R **7 Claims**



A combined closure and handle for heavy-duty thermoplastic bags constituted by a continuous beaded strip having integral depending spaced skirts. The closure member is extruded from thermoplastic material and includes longitudinally extending and spaced depending skirts; the abutting front and rear wall mouth portions of the bag are received between said depending skirt and sealing is effected therethrough transversely of the bag and across the full width thereof. By punching or similar operation a hand-hold aperture is produced centrally of the bag within the confines of the sealed skirt portions of the closure member and through the enclosed front and rear wall portions of the bag. The present invention relates to heavy-duty thermosplastic bags and to a novel method for closing and sealing the open mouth thereof after the bag will have been filled.

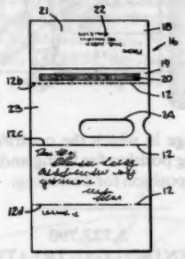
3,722,787

MAILING FORM WITH INTEGRAL REPLAY ENVELOPE ATTACHED

Joseph J. Buchheit, Bayside, N.Y., assignor to Reply-O-Letter Company, Inc., New York, N.Y.

Filed Feb. 8, 1971, Ser. No. 113,141
Int. Cl. B65d *27/04*
U.S. Cl. 229—92.3 **7 Claims**

A mailing form having a plurality of fold lines therein to provide a plurality of rectangular panels, a first of said panels containing a cut-out portion which registers upon folding with a space on an adjacent panel provided for addressee information, the entire form in at least partially folded condition adapted for insertion into a window envelope with the addressee space and registered cut-out portion aligned with the win-



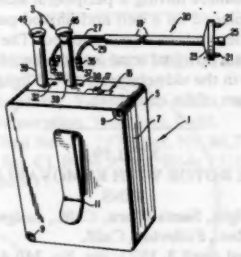
dow of the envelope. The mailing form also includes a third panel disposed between the first and second panels and adapted for return addressee information and constituting the front face of a severable replay envelope, the reverse side of the reply envelope being constituted by the second named panel.

3,722,788

ELECTRIC SHOCK PROTECTION DEVICE

Michael F. Petrecz, King of Prussia, Pa., assignor to Little Warrior Co., Upper Merion Township, Pa.

Filed Jan. 29, 1971, Ser. No. 110,975
Int. Cl. B68b *11/00*
U.S. Cl. 231—2 E **6 Claims**



An electric shock protective device having a circuit with a vibrating coil and high voltage prods telescopingly positioned on a compact housing having the battery power supply and the vibrating coil circuit therein.

3,722,789

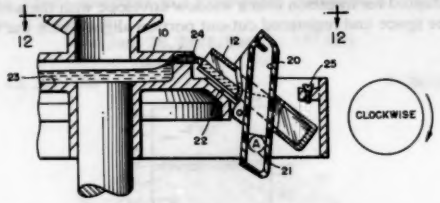
CENTRIFUGE AND SELF-POSITIONING TUBE HOLDER THEREFOR

Eugene R. Kennedy, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jan. 31, 1972, Ser. No. 222,043
Int. Cl. B04b *9/12*
U.S. Cl. 233—26 **27 Claims**

A centrifuge having a rotor equipped with a plurality of tube holders, each holder being provided with a movable weight which shifts into different stations, depending on the direction of rotation of the rotor, to alter the center of mass of the

holder and thereby pivot the same into different selected positions. Such a construction is particularly useful in a mixing and



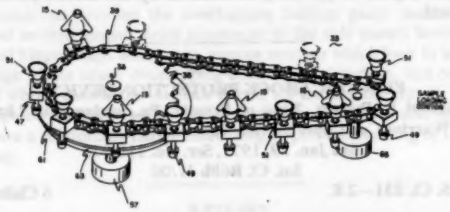
decanting centrifuge in which the centrifuge tubes are to assume one operating position for filling and/or centrifuging and another operating position for decanting.

3,722,790

SEQUENTIAL CENTRIFUGAL TREATMENT OF LIQUID SAMPLES

Samuel Natelson, Chicago, Ill., assignor to Rohe Scientific Corporation, Santa Ana, Calif.

Filed July 30, 1969, Ser. No. 845,992
Int. Cl. B04b 9/12
U.S. Cl. 233—26 **18 Claims**



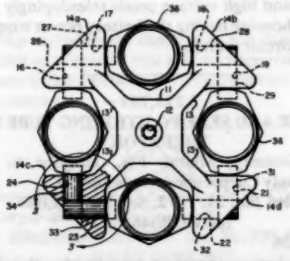
System for the sequential treatment of liquid chemical samples comprising the steps of depositing the samples in a series of top-like containers having a peripheral side chamber. The containers are placed on a belt and moved past a centrifugal field wherein the containers are rotated. The containers are then removed at a terminal zone and the heavier sample component remains in the side chamber as the lighter components flow to the bottom of the container.

3,722,791

CENTRIFUGE ROTOR WITH REMOVABLE TRUNNION PINS

Herschel E. Wright, Santa Clara, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed April 3, 1972, Ser. No. 240,440
Int. Cl. B04b 9/12
U.S. Cl. 233—26 **3 Claims**



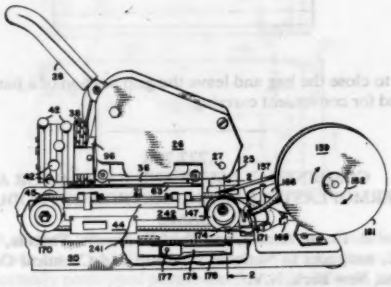
A centrifuge rotor having a core with outwardly extending support arms having removable trunnion pins for supporting a carrier.

3,722,792

TAPE PUNCH

by Frederick J. Lawrence, executor, San Francisco, Calif., and Joseph L. Lawrence, deceased, late of San Francisco, Calif., assignors to Cycle Equipment Company

Continuation of Ser. No. 727,759, May 6, 1968, abandoned.
This application Nov. 30, 1970, Ser. No. 93,756
Int. Cl. G06k 1/10
U.S. Cl. 234—38 **7 Claims**



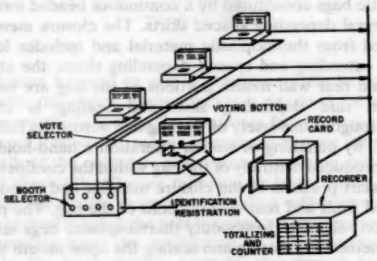
A manually operable tape punch for producing code perforations in tape in which a manually operable punch member operates a perforating mechanism including a rectangular array of die holes and a corresponding rectangular array of perforating pins. The pins are yieldably held in a raised position by spring plate means cooperating with all the pins and yieldably mounted by means of a selected plurality of compression springs. The selection of the perforations to be punched may be carried out by a code card by a plurality of adjustable members which are carried by the punch member and associated with the remaining rows of pins of said rectangular array.

3,722,793

VOTING SYSTEM

Samuel Aronoff, 1729 S. Wooster Street, Los Angeles, Calif.

Filed June 18, 1969, Ser. No. 834,283
Int. Cl. G07c 13/00
U.S. Cl. 235—50 A **3 Claims**

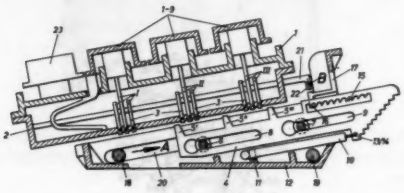


A voting system embodying a registration machine operable by the voter through a voter's identification card and controllable by the precinct officer for voters use; upon registration said registration machine electrically releases a voter's selection panel for voting; a multiplicity of voting panels are electrically coupled to a single totalizer which sequentially totalizes the vote from each panel for every voting choice on respective specialized counters from which a single card record is instantly obtainable that is suitable for quick totalization of vote from a given area; an electrically interconnected recorder automatically records the exact vote of each anonymous voter.

3,722,794
VALUE INPUT MECHANISM FOR TEN KEY CALCULATING MACHINES

Gerhard Weskamp, Thalfingen, Germany, assignor to Walter Buromaschinen GmbH, Gustetten, Germany

Filed Feb. 16, 1972, Ser. No. 226,666
Claims priority, application Germany, March 23, 1971, P 21 13 918.4
Int. Cl. G06c 29/00, 7/02, 25/00
U.S. Cl. 235—60 TK 9 Claims

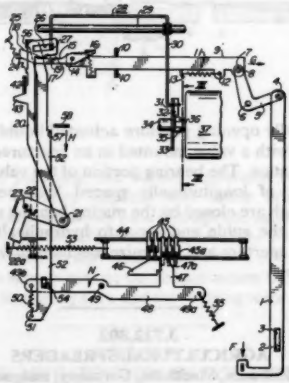


The value entering device for a calculating machine has a carriage transversely slideable beneath a key board having nine digit keys arranged in three rows of three keys each. There is a key rod for each key with the rods being positioned in groups of three corresponding to the key rows. There are ten longitudinally moveable slide members mounted in the carriage with each slide member having three stops corresponding to the three groups of key rods so that pressing a key in the key board positions a key rod in the path of its corresponding stop to position the slide member responsive to the value of the depressed key.

3,722,795
DIVISION CONTROL MECHANISM

Gian Piero Barozzi, and Giancarlo Horeschi, both of Crema, Italy, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1971, Ser. No. 113,586
Claims priority, application Italy, Feb. 11, 1970, 20470 A/70
Int. Cl. G06c 23/00
U.S. Cl. 235—62 F 4 Claims

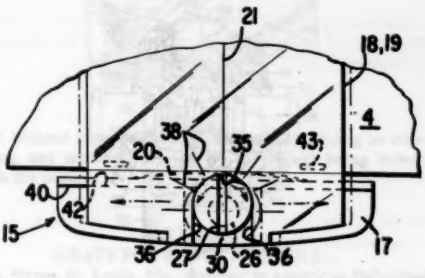


A device for momentarily stopping a calculating machine comprising clutch for releasably connecting a motor shaft with the main shaft of the machine. A link mechanism to be actuated by the last step of the tabulating stroke of a carriage in division operation is provided to cause the clutch to operatively connect the motor shaft with the main machine shaft only after the completion of the tabulating stroke for thereby ensuring that a sufficient safety time is provided between the completion of the tabulating stroke and the start of the operation of the machine.

3,722,796
SLIDE RULE CURSOR

Jack Fairchild Fleming, Morris Plains, N.J., assignor to Sterling Plastics Co., Mountainside, N.J.

Filed May 11, 1971, Ser. No. 142,267
Int. Cl. G06g 1/02
U.S. Cl. 235—70 B 6 Claims

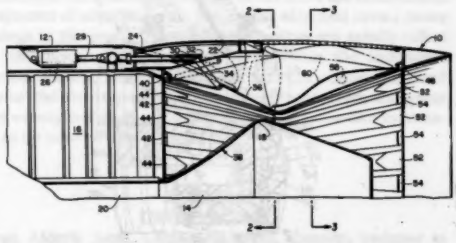


A slide rule is provided with a cursor comprising two transparent face plates, each carrying a hairline indicator, which are joined together and hold an end slide member between them at each end of the cursor by connecting means which include an eccentric adjusting member that can be displaced incrementally by a user of the slide rule so as to displace one of the face plates relative to the other for precise realignment of the positions of the hairlines relative to scales on both sides of the rule.

3,722,797
CONVERGENT-DIVERGENT EJECTOR EXHAUST NOZZLE

William R. Hammill, Van Nuys, Calif., assignor to CCI Aerospace Corporation, Van Nuys, Calif.

Filed Nov. 4, 1970, Ser. No. 86,728
Int. Cl. B63h 25/46; B64c 15/10
U.S. Cl. 239—265.17 7 Claims



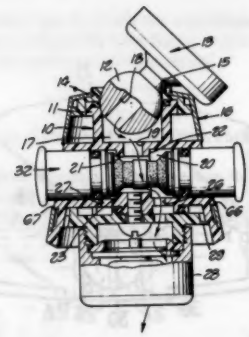
A variable exhaust nozzle for an air breathing propulsion system having an independently actuable convergent-divergent iris leaf section surrounding a fixed cut-off plug, a self-actuating blow in door assembly located within the exterior nozzle shell adjacent the convergent section.

3,722,798

COMBINED AERATOR-SPRAY ASSEMBLY

James H. Bletcher, Pacific Palisades, and Jack K. Rauh, Hacienda Heights, both of Calif., assignors to trust of Ralph E. Bletcher, deceased; Frederick Robertson; Gary Robertson; Lenora Bucknell; Richard J. Bletcher; Marcia Liston, trustee; Daniel E. Liston; Carl A. Liston; James H. Liston; Hazel Brondum; Pearl Bletcher and Ernest H. Bucknell, part interest to each

Filed Oct. 29, 1970, Ser. No. 85,102
Int. Cl. B05b *1/16*
U.S. Cl. 239—428.5 7 Claims



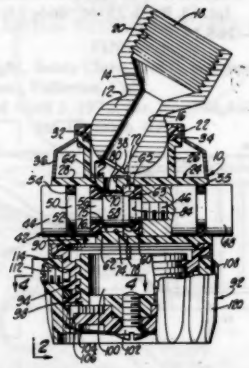
There is disclosed herein a swinging spray assembly including both aerator and spray devices. A push button valve is provided to divert water through either an aerator or through openings around the aerator to provide a spray. The valve assembly includes collar members formed of a resilient mvterial and which are formed in a manner such that in either position of the valve fluid pressure tends to maintain the valve in a selected position.

3,722,799

ADJUSTABLE SHOWER HEAD ASSEMBLY WITH DIVERTER VALVE

Jack Rauh, Hacienda Heights, Calif., assignor to Modern Faucet Manufacturing Company, Los Angles, Calif.

Filed June 16, 1971, Ser. No. 153,578
Int. Cl. A62c *31/00*
U.S. Cl. 239—443 5 Claims



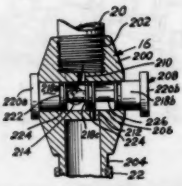
A shower head assembly having an upper and lower portion, wherein the upper portion has a diverter valve mechanism slidably mounted therein, and the lower portion of the assembly is in threaded contact with the upper portion and moveable with respect thereto, thereby altering the exit apertures of the shower head assembly and adjusting water flow therefrom.

3,722,800

SHUTTLE-TYPE DIVERTER VALVE FOR USE WITH HANDLE-CONTROLLED SPRAY

Harold Shames, Ardsley; Sidney J. Shames, Briarcliff Manor, both of N.Y., and John F. Logan, Pequannock, N.J., assignors to Melard Manufacturing Corp. by said Logan, Bronx, N.Y.

Division of Ser. No. 830,216, May 28, 1969, Pat. No. 3,637,143. This application May 27, 1971, Ser. No. 147,323
Int. Cl. B05b *11/00*
U.S. Cl. 239—447 2 Claims



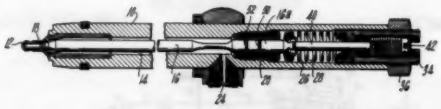
A handle-controlled spray that is normally in closed condition is provided in combination with a shuttle-type diverter valve that selectively provides flow along two paths one leading to the spray and the other to a shower head. The diverter valve controller is of a construction to cooperate with portions of the valve body to define two transfer flow chambers that insure discharge flow along desired paths depending upon the position of the controller.

3,722,801

FUEL INJECTOR

Marcel Chapuis, Versailles, France, assignor to Stanadyne, Inc., Hartford, Conn.

Filed Sept. 11, 1970, Ser. No. 71,597
Int. Cl. F16k *21/10*
U.S. Cl. 239—533 4 Claims



An inwardly opening pressure actuated liquid fuel injector is provided with a valve mounted in an apertured valve guide for reciprocation. The bearing portion of the valve is provided with a pair of longitudinally spaced V-shaped peripheral grooves which are closed by the mating bearing surface of the aperture of the guide and serve to hydraulically center the valve in the aperture and minimize mechanical friction during reciprocation.

3,722,802

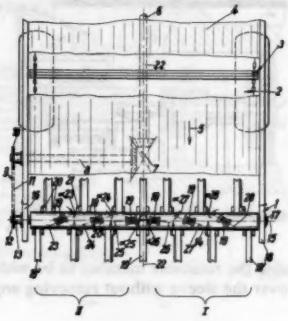
AGRICULTURAL SPREADERS

Hubert Kreienbaum, Stadtlohn, Germany, assignor to Wilhelm Kemper KG, Stadtlohn, Germany

Filed Feb. 19, 1971, Ser. No. 116,941
Claims priority, application Germany, Feb. 20, 1970, P 20 07 871.1; April 22, 1970, P 20 19 273.8
Int. Cl. A01c *3/06*
U.S. Cl. 239—658 10 Claims

An implement for spreading manure, hay, straw, and the like; it comprises a cylindrical carrier body or drum to which

there are pivoted tines which swing freely on axes at an angle to the direction of the cylindrical axis of the carrier drum and about which the carrier drum is rotatably driven. Material



picked up by the tines, from a load to be spread, on rotation of the carrier drum, is propelled both outwardly and axially of the carrier drum.

3,722,803

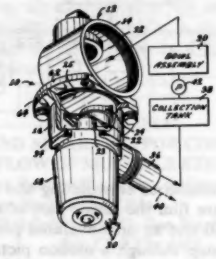
COMBINED PUMP AND CUTTING APPARATUS

James M. Kemper, Los Angeles, Calif., assignor to Monogram Industires, Inc., Los Angeles, Calif.

Filed May 28, 1971, Ser. No. 147,810

Int. Cl. B02b *1/00*

U.S. Cl. 241—46.02 **7 Claims**



A combined pumping and cutting apparatus for a toilet system where sanitary napkins and other nondissolving materials are sheared as they pass through the apparatus. The apparatus includes two chambers separated by a tube which directs the material to and cooperates with a rotor to cause shredding by a scissor action; the scissor action being accomplished by the stationary tube and the rotating rotor.

3,722,804

ROTARY PUMP HAVING SWASH TYPE IMPELLER

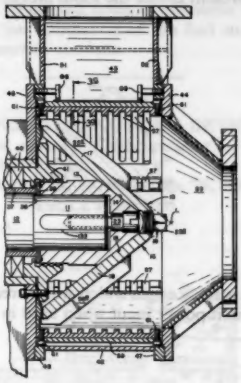
Paul I. Petersen, Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Feb. 22, 1971, Ser. No. 117,529

Int. Cl. B02c *23/00*

U.S. Cl. 241—46.11 **16 Claims**

A rotary pump constructed for non-clogging operation with a swash plate type impeller of angle-shaped cross-section, the angle shape presenting a ridge which extends perpendicular to the impeller axis, thereby attaining improved balanced and non-vibrating pumping operation, this pump being operable



with or without means for simultaneously shredding or comminuting any material carried by the liquid being moved through the pump.

3,722,805

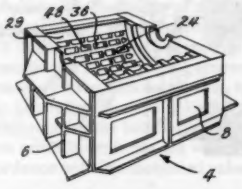
GRATE FOR REDUCTION MILL

Sven B. Strom, St. Louis, Mo., assignor to American Pulverizer Company, St. Louis, Mo.

Filed Aug. 6, 1971, Ser. No. 169,647

Int. Cl. B02c *13/04, 13/13*

U.S. Cl. 241—73 **7 Claims**



The grate of a reduction mill comprises a housing, a rotor, and a plurality of individual grate bar panels positioned side-by-side and arranged in an arc below the rotor in the housing. Each grate bar has two parallel ribs which extend axially through the housing and interconnecting the ribs are axially spaced connectors which in combination with the ribs form openings contained wholly within the individual grate bar panels. Spacers project outwardly and circumferentially from the ribs, and the spacers are axially offset from the connectors. The spacers of adjacent grate bar panels abut and create more openings in the grate. These other openings are axially offset from the openings contained wholly within the individual grate bar panels. Since the spacers and the connectors, and likewise the two types of openings, are staggered, the grate wears evenly and does not tend to wear a groove-like indentation, as do conventional grates.

3,722,806

CRUSHER JAW

George Alderic Jette, Calgary, Alberta, Canada, assignor to Irving Industries (Foothills Steel Foundry Division) Ltd., Calgary, Alberta, Canada

Filed Jan. 26, 1971, Ser. No. 109,893

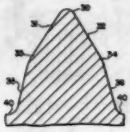
Claims priority, application Canada, Feb. 5, 1970, 074121

Int. Cl. B02c *1/10*

U.S. Cl. 241—291 **6 Claims**

A crusher face plate for use in the devices for crushing equipment for rock ore, gravel stock and other like bulk

materials. Heretofor devices of this kind utilized a round nose tooth profile and were somewhat inefficient in the use of power. In the present device the tooth profile is provided with



several sharp crushing edges which will increase the crushing efficiency per unit power input when used in standard crushing devices.

3,722,807

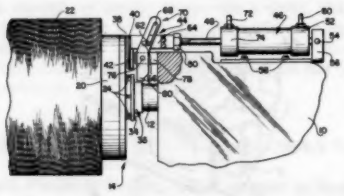
WINDING APPARATUS

Robert L. Swinehart, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed March 1, 1971, Ser. No. 122,578

Int. Cl. B65h *54/02, 67/04*

U.S. Cl. 242—18 R **6 Claims**



A winder, such as a Model 959 take-up, manufactured by Leesona Corporation, Warwick, Rhode Island, has a rotary chuck mounted on a winder base and has chuck members resiliently urged into gripping engagement with a package core removably telescoped on the chuck. A lever is pivoted to the winder base and is operated in one direction by a fluid motor to release the chuck members from gripping engagement with the core. A brake member is pivotally connected with the lever in such a manner that operation of the motor in an opposite direction brakes the chuck and maintains the lever out of operating engagement with the chuck. The motor is controlled by a valve system which vents one side of the motor into the other side for positioning both the brake member and the lever out of engagement with the chuck.

3,722,808

CHUCK FOR ROTATABLE MEMBERS

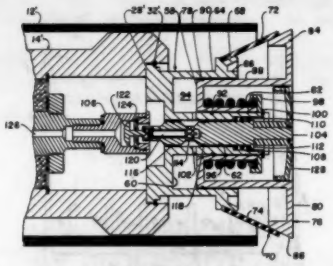
Edward A. Brown, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,323

Int. Cl. B65h *75/30, 79/00*

U.S. Cl. 242—46.4 **3 Claims**

Quick release chuck for chucking rotatable members or tubular cores wherein a flexible sleeve mounted on one end of a mandrel is caused to move axially inwardly and radially outwardly against an end of a rotatable member to hold the rotatable member in centered and seated position for rotation about its axis, and is movable axially outwardly and radially inwardly to enable the rotatable member to be withdrawn from the mandrel over the sleeve without removing any part of the chuck.



3,722,809

ENDLESS BAND WINDING APPARATUS

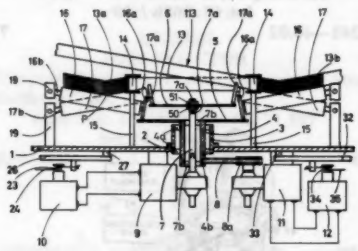
Herbert Leisring, Fellbach, Germany, assignor to Robert Bosch Photokino GmbH, Stuttgart-Unterturkheim, Germany

Filed Sept. 20, 1971, Ser. No. 181,888

Claims priority, application Germany, Sept. 24, 1970, P 20 47 043.3

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 R **14 Claims**



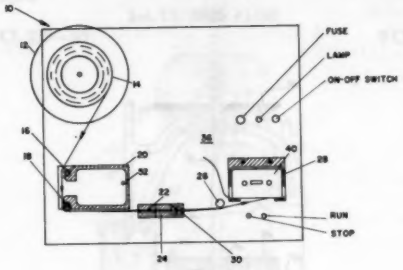
Apparatus for simultaneous convoluting and unwinding of endless motion picture film the major part of which is convoluted to form a roll and an unconvoluted part of which is transported step-by-step through a motion picture projector has two sets of alternating driving rollers which extend radially of and support the roll of convoluted film from below so that the axis of the roll is vertical. The rollers of one set support the outer annular section of the roll and are inclined downwardly toward the axis of the roll. The rollers of the other set support the inner annular section of the roll and are inclined outwardly and downwardly away from the axis of the roll. Each set of rollers is driven by a separate variable-speed electric motor through the intermediary of a horizontal turntable in such direction that the outer section of the roll collects and the inner section of the roll pays out the film. The speed of the motor which drives the one set of rollers is adjustable by a first detector which detects the changes in tension of that portion of the film which is being convoluted on the outer section, and the speed of the motor which drives the other set of rollers is adjustable by a second detector which detects the changes in tension of that portion of the film which is being withdrawn from the inner section of the roll. At least one of the turntables is movable between several levels to thereby change the inclination of the respective set of rollers and to thus enable the apparatus to support and rotate rolls of different outer diameters.

3,722,810

PRE-RECORDED MAGNETIC TAPE EDITING DEVICE

Trevor William Kendall, Long Island, N.Y., assignor to Dictaphone Corporation, Bridgeport, Conn.

Filed Jan. 22, 1970, Ser. No. 4,858
Int. Cl. B65h 19/26, 19/28, 21/00
U.S. Cl. 242—56 R 10 Claims



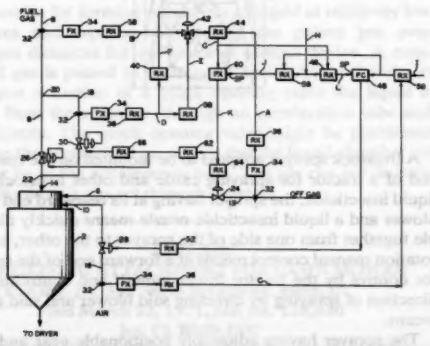
A tape editing device for use in splicing the lead end of a supply of magnetic tape on a supply reel to the free end of a leader tape on a takeup reel, which takeup reel is adapted to be rotated to draw tape from the supply reel after the splice is made. The editing device includes an enclosed buffer chamber having an open end positioned adjacent the path of travel of the magnetic tape as it is drawn from the supply reel and a splicing block, having a plurality of apertures therein, positioned in the path of travel of the magnetic tape between the buffer chamber and the takeup reel. A source of vacuum is operably connected to the buffer chamber and a magnetic pickup head control means is provided for selectively connecting the source of vacuum to the holes in the base of the splicing block in response to a prerecorded tone signal on the tape, whereby the portion of the tape passing over the splicing block, upon receipt of a tone signal by the magnetic head, is held immobile against the splicing block and excess tape, discharged from the supply reel as it is stopped, between the supply reel and the splicing block, is drawn into the buffer chamber through the open end thereof under the influence of said vacuum source.

3,722,811

METHOD AND APPARATUS FOR CONTROLLING THE FLOW OF MULTIPLE STREAMS

Carl L. Osburn, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 13, 1971, Ser. No. 162,058
Int. Cl. F23n 1/02
U.S. Cl. 236—14 12 Claims



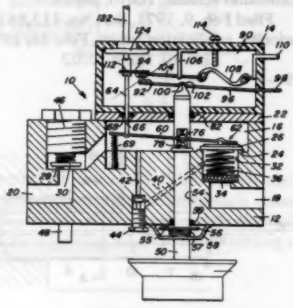
A method and apparatus for controlling the flow of first and second fuel streams and an air stream by selectively measuring the second fuel stream in response to the flow rate of said second fuel stream and controllably combining the three streams at rates responsive to a set point signal and a signal responsive to the computed, total, combustible heating value per unit time of the summation of the fuel streams flowing through their respective conduits.

3,722,812

TEMPERATURE CONTROL DEVICE

H. Kenneth Ward, Arcadia, Calif., assignor to Ward & Son, Inc., City of Industry, Calif.

Filed Oct. 12, 1970, Ser. No. 79,768
Int. Cl. F23n 5/06
U.S. Cl. 236—15 A 15 Claims



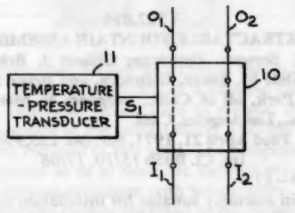
A temperature control device for regulating two primary energy sources simultaneously is disclosed. A single rotatable shaft provides the primary adjustment of a valve for regulating gas flow and the primary adjustment of the main contacts for an electric supply regulator, whereby the two regulators may be adjusted to a desired temperature setting. Secondary adjustment and operation of the device is by means of a temperature sensitive capillary tube which operates in response to a parameter to be controlled to expand or contract a bellows. The movable diaphragm of the bellows is connected by way of a second shaft to position both the gas valve and the electric contacts in accordance with the measured value.

3,722,813

TEMPERATURE-SENSITIVE REVERSING VALVE APPARATUS

Gene W. Osheroff, Las Vegas, Nev., and Laurence McGann, Los Angeles, Calif., assignors to Fluidtech Corporation, Inglewood, Calif.

Filed Dec. 7, 1971, Ser. No. 205,514
Int. Cl. F24f 11/06
U.S. Cl. 236—1 C 22 Claims



In the present invention, a combination of four valves arranged to form a bridge is coupled to a temperature-pressure transducer that interconnects the input and output channels of the bridge according to whether the ambient environment of

the transducer is relatively warm or cool. More specifically, the transducer is coupled to both a low pressure source and a high pressure source and will apply one combination of such pressures to the bridge if the transducer environment is relatively cool and another combination of such pressures if the transducer environment is relatively warm. In response to these signals, one pair of another of the valves in the bridge are closed, with the result that the connections between the bridge's input and output channels are thereby reversed.

3,722,814

METHOD OF BLOWING SUCH FLUID AS REDUCING GAS INTO A FURNACE

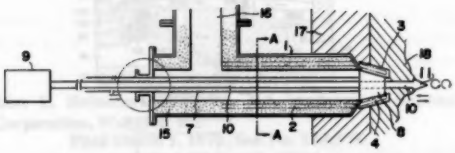
Tsuneo Miyashita, Kawasaki, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1971, Ser. No. 113,862

Claims priority, application Japan, Feb. 13, 1970, 45/12147

Int. Cl. B05b *15/02*

U.S. Cl. 239—1 **3 Claims**



A method and apparatus for (a) injecting fluids, particularly reducing gases, through a tuyere into an operating furnace, and (b) safely cleaning out plugged tuyeres, in which a seal is provided in the tuyere so that a back pressure in excess of the furnace pressure can be developed. A rotatable borer is provided forwardly of the seal to remove solids plugging the tuyere. The seal and the borer are coaxially mounted on a retractable shaft so that they can be simultaneously withdrawn and fluid injection resumed immediately the tuyere is cleaned.

3,722,815

FOG ABATEMENT WITH POLYHYDRIC ORGANIC COMPOUNDS

Zack J. Moore, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 24, 1971, Ser. No. 146,557

Int. Cl. A01g *15/00;* **E01h** *13/00;* **B01d** *17/00*

U.S. Cl. 239—2 R **5 Claims**

Method for fog and cloud abatement wherein a normally liquid polyhydric aliphatic organic compound containing 2 to about 26 carbon atoms such as glycerine is dispersed into the fog in a particle size range from about 10 to about 100 microns.

3,722,816

RETRACTABLE FOUNTAIN ASSEMBLY

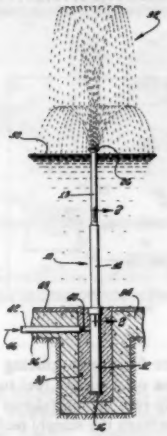
Andrew W. Stewart, Pasadena; Gilbert J. Britzman, West Covina; Dale M. Bauer, Glendora, and Bruce E. Britzman, Baldwin Park, all of Calif., assignors to Meridian Enterprises, Inc., Los Angeles, Calif.

Filed April 21, 1971, Ser. No. 135,990

Int. Cl. B05b *15/10, 17/08*

U.S. Cl. 239—17 **2 Claims**

A fountain assembly suitable for installation in a swimming pool made up of a plurality of extendable and retractable telescoping conduit sections. A portion of said assembly is anchored in the swimming pool bottom so that conduit sections may be extended upward therefrom to form a fountain or retracted therein flush with the pool bottom so as to present no swimming or diving hazards. The fountain is extended by activation of pressurized liquid engaging liquid seals in said conduit sections to maintain said assembly in its extended position. Said telescoping conduit sections being adapted for



bleeding when said pressurized liquid ceases thereby allowing said conduit sections automatically to settle back to their retracted positions.

3,722,817

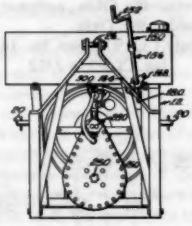
SPRAYER

Albert B. Fletcher, Spalding, Nebr.

Continuation-in-part of Ser. No. 768,574, Aug. 19, 1968, abandoned, which is a continuation of Ser. No. 510,138, Nov. 8, 1965, abandoned. This application Jan. 25, 1971, Ser. No. 109,575

Int. Cl. B05b *7/24*

U.S. Cl. 239—77 **11 Claims**



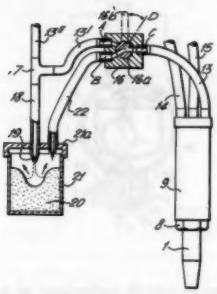
A livestock sprayer adapted to be mounted on the rearward end of a tractor for spraying cattle and other livestock with liquid insecticide, the sprayer having at its rearward end an air blower and a liquid insecticide nozzle means quickly directable together from one side of the sprayer to the other, a rapid rotation manual control means at a forward end of the sprayer for control by the tractor driver himself and controlling the direction of spraying by directing said blower and said nozzle means.

The sprayer having adjustably positionable gear and shaft means drivably connecting the crank handle means and blower housing.

3,722,818
GAS CUTTING AND MARKING DEVICE

Hidehiko Hayasaki, Tokyo, and Takehiko Hayashi, Saitama, both of Japan, assignors to Kabushiki Kaisha Tanaka Seisakusho, Tokyo, Japan

Filed March 5, 1971, Ser. No. 121,325
Claims priority, application Japan, March 19, 1970, 45/22696
Int. Cl. B05b *13/00*
U.S. Cl. 239—85 5 Claims

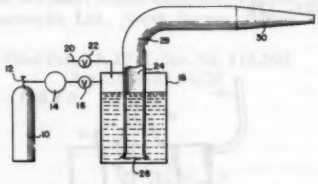


A device for gas cutting, which is also applicable for marking by operating a valve so as to eject a mixed stream of carrier gas such as air and marking powder such as metal powder from an ejecting nozzle usually used for ejection of cutting oxygen. The device can be used either for gas cutting or for making a cutting line by a very simple switching operation.

3,722,819
PULSED JET RIOT CONTROL APPARATUS

James M. Hall, Gaithersburg, Md., and Louis L. Clipp, McLean, Va., assignors to Exotech Incorporated, Gaithersburg, Md.

Filed April 19, 1971, Ser. No. 135,235
Int. Cl. B05b *1/08*
U.S. Cl. 239—102 9 Claims



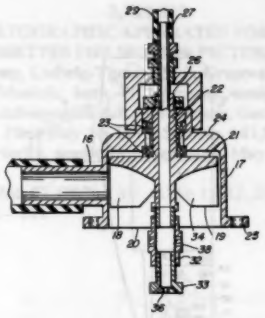
Apparatus for forming pulsed jets of liquid at relatively low pressures and capable of expelling the pulsed jets over moderate distances for use as a riot control device. A compressed gas is passed to a chamber having liquid therein so that upon actuation of a quick opening valve the liquid is forced from the chamber, through an acceleration tube and out a nozzle. The quick opening valve might be positioned between the pressurized gas source and the liquid chamber, or it might be in the acceleration tube. The gas can act directly on the liquid or it can act through a piston.

3,722,820
FERTILIZING ATTACHMENT FOR LAWN MOWER

Joseph E. Klint, Jr., 355 North Broadway, Joliet, Ill.

Filed March 22, 1971, Ser. No. 126,420
Int. Cl. B05b *3/00*
U.S. Cl. 239—129 3 Claims

A turbo-powered attachment to a gas-engine powered lawn mower suitable for dispensing liquid fertilizers, insecticides and fungicides, connected to the exhaust stack of said engine for passage of high velocity gases therethrough, said attachment having a hollow turbo-shaft driven at high rotational speed by the high velocity exhaust gases, a supply tank with a

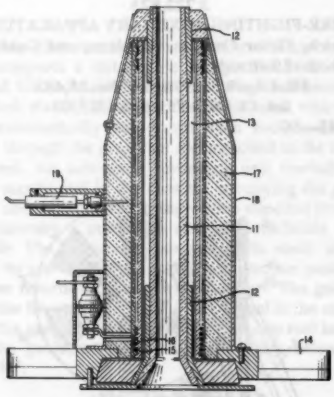


conduit connected to one end of the hollow turbo-shaft, a valve for regulating liquid flow therethrough connected to a centrifugal spray nozzle at the other end of the hollow turbo-shaft, said attachment being adapted for mounting on the handlebar of the mower.

3,722,821
DEVICES FOR PROCESSING MOLTEN METALS

Raymond E. Jaeger, Basking Ridge, and Robert Ernest Nickell, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 78,822, Oct. 7, 1970, abandoned. This application June 3, 1971, Ser. No. 149,657
Int. Cl. B67d *3/02*
U.S. Cl. 239—133 8 Claims



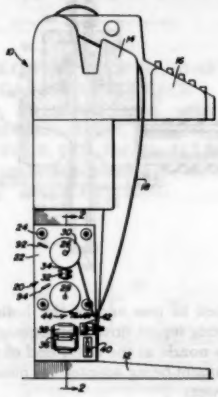
A nozzle is described for use with molten metals at elevated temperatures. The nozzle consists of a ceramic cylinder surrounded by a resistance heater used to preheat the ceramic part before exposure to the molten metal. Thermal stresses in the ceramic are reduced in two ways. The composition of the ceramic is adjusted so as to minimize thermal expansion and variations in thermal expansion with temperature. Also, high thermal conductivity sleeves are fitted on the ceramic cylinder to reduce temperature variations in the ceramic. These nozzles have considerably longer life than conventional nozzles made from graphite. Other apparatus in common with the nozzle depend for their utility on the ceramic composition; namely, the concentration of magnesia in the stabilized zirconium oxide ceramic.

3,722,822

TAPE TAKE-UP DRIVE ASSEMBLY

Samuel P. Wallace, 929 Georgia, S.E., Albuquerque, N. Mex.

Filed Dec. 8, 1969, Ser. No. 882,849
Int. Cl. B65h 25/32, 25/22, 25/04
U.S. Cl. 242—67.4 7 Claims



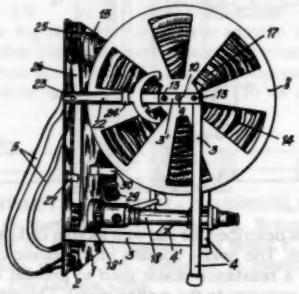
A tape handling device for a tape processing machine having a punch tape unit from which the tape is expelled. An upper take-up reel driven by a motor drive is rendered operative under the control of a tape tension switch. Magnetic means releasably hold reels on the upper and lower reel shafts. The motor drive is reversible and variable in speed for tape take-up and rewind purposes.

3,722,823

FIRE-FIGHTING AUXILIARY APPARATUS

Arturo Reich, Elcksr Onlagen, Silvplana, and Guido Huder, Surlej, both of Switzerland

Filed April 3, 1970, Ser. No. 25,453
Int. Cl. B65h 75/40; A45f 3/08
U.S. Cl. 242—86 4 Claims



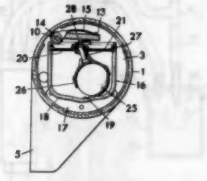
A fire-fighting auxiliary apparatus which enables one person alone to easily and quickly connect the hose to the hydrant as well as to unwind and lay out the hose. The use of a hose which is spooled on a brakable reel and the handling of same in combination with a portable unit can most remarkably prolong the service life of a hose. For a synthetic fire hose especially spooled storage is very economical.

3,722,824

AUTOMATIC LOCKING DEVICE FOR A SAFETY BELT IN A MOTOR CAR

Yoshihiro Hayashi, Toyota, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun, Aichi Prefecture, Japan

Filed Nov. 23, 1971, Ser. No. 201,291
Claims priority, application Japan, Nov. 24, 1970, 45/116605
Int. Cl. A62b 35/00; B65h 63/04
U.S. Cl. 242—107.4 2 Claims



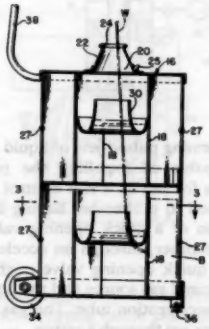
An automatic locking device for a safety belt in a motor car comprising a globe member adapted to move detecting an acceleration of the car and a locking assembly adapted to work according to the motion of the globe member thereby to prevent rotation of a reel shaft of the safety belt instantly when a positive or negative acceleration such as an abrupt brake or collision is applied to the car. In the present device, the motion of the globe member can be remarkably magnified by a magnifying element thereby to effect a rapid and reliable locking operation of the locking assembly.

3,722,825

WIRE DISPENSER

Arthur B. Phillips, 2429 E. 30th, and Roy E. Thompson, Rt. 4, P.O. Box 1846, both of Bremerton, Wash.

Filed Oct. 13, 1971, Ser. No. 188,985
Int. Cl. B65h 49/00; B62b 1/00
U.S. Cl. 242—129 11 Claims



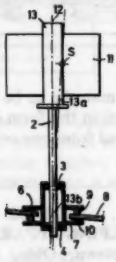
A mobile wire dispenser having a housing supported by wheels. The housing has a central hollow core with a plurality of side openings communicating with the hollow interior. The housing also has a plurality of recesses around the core adapted to hold boxes of wire with the wire passing out of the boxes through the openings and up through the hollow core. An inverted funnel is provided on the top of the core to guide the wire out of the core.

3,722,826

UNWINDING DEVICE FOR YARN SPOOLS

Peter Herrmanns, Stommeln near Cologne, Germany, assignor to FMN Schuster & Co., Efferen near Cologne, Germany

Filed April 9, 1971, Ser. No. 132,766
Claims priority, application Germany, Jan. 21, 1971, P 21 02 696.0
Int. Cl. B65h *49/00*; D01h *7/16*
U.S. Cl. 242—129.5 13 Claims



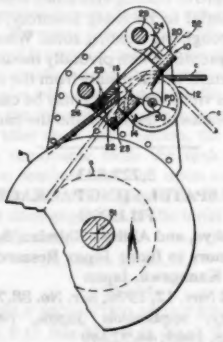
An unspooling or unwinding device of particular utility for use in unwinding and respooling thread prior to further processing. The device includes a spindle assembly resiliently mounted to enable the assembly and a spool of thread thereon to rotate about the center of gravity of the assembly. To reduce the effect of an unbalanced spool, the spindle within the spool takes the form of a heavy cylindrical weight with the result that the center of gravity of the assembly shifts only slightly relative to the geometric center, during rapid rotation of the spool and spindle during unwinding. The spindle shaft is supported for rotation by spaced apart bearings at a location spaced from the spindle, and the supports for the bearings are resiliently mounted so the shaft can tilt or move radially to allow the spool and spindle to rotate about their common center of gravity.

3,722,827

FAIRLEAD CARRIAGE

Stan Hrescak, Burnaby, British Columbia, Canada, assignor to B. C. Gearworks Ltd., North Surrey, British Columbia, Canada

Filed Feb. 12, 1971, Ser. No. 114,803
Int. Cl. B65h *54/28*
U.S. Cl. 242—158.4 R 5 Claims



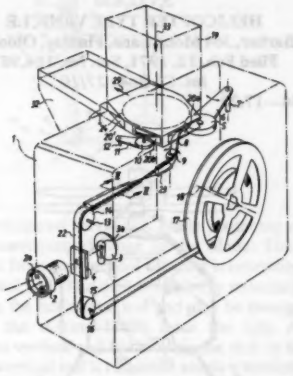
A level-wind fairlead carriage is reciprocably mounted for traversing along the length of a winch drum. The carriage is provided with a fairlead sheave rotatably mounted on a bracket for movement about an axis parallel to the axis of the winch drum. The bracket is mounted for pivotal movement about a second axis which lies on a line generally tangent to the winch drum. The pitch diameter of the fairlead sheave also ends on the second axis.

3,722,828

CINEMATOGRAPHIC APPARATUS FOR USE WITH CASSETTES FOR MOTION PICTURE FILM

Rudolf Kremp, Ludwig-Thoma-Pl. 3, Grunwald, and Fridolin Hennig, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1971, Ser. No. 141,825
Claims priority, application Germany, May 21, 1970, P 20 24 646.2
Int. Cl. G03b *1/04*; G11b *15/32*, *23/04*
U.S. Cl. 242—181 10 Claims



A motion picture projector wherein the top wall of the housing supports a detachable upright duct for a stack of horizontal film-containing cassettes. The lowermost cassette of the stack dwells in a projection position in which the film can be automatically withdrawn from such cassette to be threaded through the projector and attached to the core of the takeup reel. An automatic rewinding unit rewinds the film onto the supply reel in the cassette occupying the projection position, and such cassette is thereupon expelled from projection position by a pusher to enter a detachable collecting receptacle. The lowermost cassette of the stack in the duct descends by gravity and occupies the projection position when the pusher returns to its retracted position. The guide means wherein the film passes from the supply reel in the cassette occupying the projection position to the takeup reel in the housing of the projector has a channel which twists the film through 90°.

3,722,829

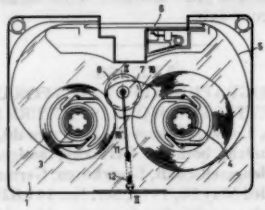
CASSETTE

Theodorus Franciscus Arnoldussen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,549
Claims priority, application Netherlands, Jan. 16, 1970, 7000677
Int. Cl. G11b *23/10*
U.S. Cl. 242—199 3 Claims

A cassette for use in an apparatus for the recording and/or playback of recording on or from a strip-shaped record carrier, which cassette contains a take-up core and a supply core for the record carrier and a single, flanged, freely rotatable,

and displaceable, guide roller which is mounted so as to be floating and engages the outer circumferences of the record



carrier rolls wound on the supply and take-up cores. The flanges of the roller simultaneously guides the outer turns of both record carrier rolls.

3,722,830

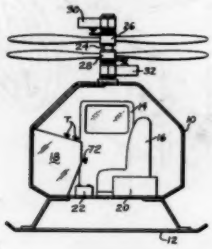
HELICOPTER TYPE VEHICLE

Gerald L. Barber, 364 Mona Lane, Findlay, Ohio

Filed Feb. 12, 1971, Ser. No. 114,987

Int. Cl. B64c *27/10*

U.S. Cl. 244—17.23 **6 Claims**



The invention discloses a helicopter type vehicle having coaxial counter rotating propellers above the cabin of the vehicle, each propeller being fixed in pitch as opposed to conventional helicopter propellers which vary in pitch during rotation of the propeller. The counter rotating propellers provide lift for lifting the vehicle from the surface, and forward thrust on the vehicle is developed by shifting the center of gravity of the vehicle to tilt the axis of rotation of the propellers with the shifting of the center of gravity of the vehicle being accomplished in at least one instance, by mounting the propeller drive motors adjacent the respective propellers and rotating the motors bodily about the axis of rotation of the propellers.

ERRATA

For Classes 244—188 thru 254—124 see:
Patents Nos. 3,722,840 thru 3,722,864

3,722,831

MIXING MACHINES

Horst Bialas, Georgsmarienhutte, and Friedrich Lindenthal, Osnabruck, both of Germany, assignors to Dierks & Sohne, Osnabruck, Germany

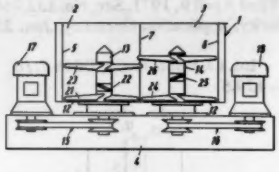
Filed July 18, 1969, Ser. No. 842,949

Claims priority, application Germany, July 20, 1968, P 17 82 115.7; Dec. 19, 1968, P 18 15 582.3

Int. Cl. B01f *7/00, 15/00*

U.S. Cl. 259—6 **14 Claims**

A high speed mixing machine in which power driven tools are arranged to rotate in a mixing vessel to produce a forced vortex-like movement of the material being mixed has a plurality of separate tools rotatable in coacting compartments of the vessel which merge with one another so that the material,



particularly synthetic material to be processed and/or mixed e.g. with other material in the form of additives or liquids, is continuously transferred from one compartment to another of the vessel.

3,722,832

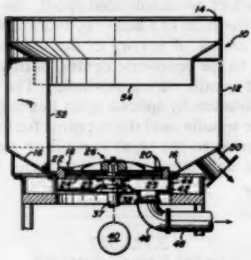
PULPING APPARATUS

Peter Seifert, Middletown, Ohio, assignor to The Black Clawson Company, Hamilton, Ohio

Filed March 10, 1971, Ser. No. 122,809

Int. Cl. B01f *15/02, 7/16*

U.S. Cl. 259—44 **2 Claims**



A waste treatment tub having a cylindrical side wall, a perforated bottom wall and a rotor mounted on the bottom wall is provided with a baffle which extends across the tub in chord relationship to the circle defined by the cylindrical side wall. The chord-like baffle shifts the center of the vortex formed by the rotor to a position non-coincident with the axis of rotation of the rotor to improve cutting efficiency and also causes undisintegrated material to be flung inwardly, from whence it can be carried through the treating zone. When the rotor is of the type which is provided with pivotally mounted hammers or flails, the flow pattern which results from the use of the chord-like baffle reduces vibrations which may be caused by material collecting on the vanes of the rotor and the hammers or flails.

3,722,833

METHOD OF SPATULATING PACKAGED DENTAL FILLING

Kiyoshi Inoue, Tokyo, and Akihiko Shimizu, Sagamihara, both of Japan, assignors to Inoue Japax Research Incorporated, Yokohama-shi, Kanagawa, Japan

Filed Nov. 12, 1970, Ser. No. 88,738

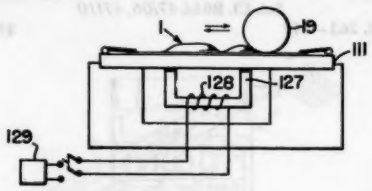
Claims priority, application Japan, Nov. 15, 1969, 44/92248; Nov. 15, 1969, 44/92249

Int. Cl. B01f *13/08*

U.S. Cl. 259—72 **2 Claims**

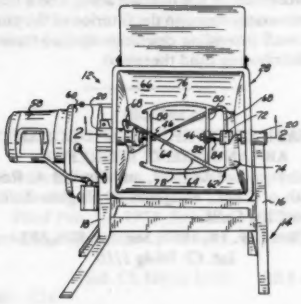
Pre-packaged dental filling ingredients for use by dentists. The ingredients which are in part liquid and in part powder are encapsulated and sealed tightly in a flexible-membrane

formed bag and therein separated one from the other which separation is released by the compression of the bag to cause the ingredients to be successively brought into contact and mixed together. The mixture, confined within the bag, is



spatulated to form a paste or semi-solid, ready for application to a patient's tooth. The spatulation may be carried out advantageously with apparatus adapted to compressively roll over the flexible bag supported on a surface or squeeze the bag against the surface.

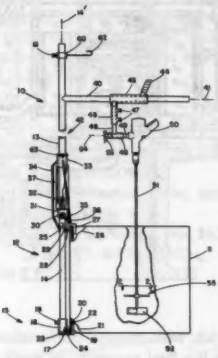
3,722,834
DOUGH MIXING MACHINE
Sidney Bakewell, 5945 Martin Ave., Dearborn, Mich.
Filed Jan. 20, 1972, Ser. No. 219,345
Int. Cl. B01f *7/08*
U.S. Cl. 259—105 **7 Claims**



In a dough mixer having a frame, a tank, a power transmission driving a sleeve and a coaxial shaft, both projecting through one end wall of the tank, the improvement which includes a longitudinally adjustable idler shaft spaced from and aligned with the power driven shaft and extending through the other tank wall. An outer paddle assembly nests within the tank and at one end is secured to said drive shaft sleeve and at its other end is journalled upon the idler shaft. An inner paddle assembly rotates within the outer paddle assembly, at one end is secured to the drive shaft and at its opposite end is journalled upon the idler shaft and wherein, the inner paddle assembly is easily removable from the tank for cleaning by removing the two retainer nuts and upon axial retraction of the idler shaft sufficient to disengage from the inner paddle assembly to permit disengagement of the inner paddle assembly from the drive shaft.

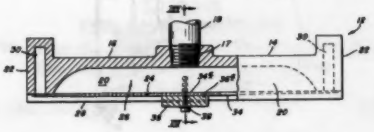
3,722,835
MOVABLY MOUNTED MORTAR MIXER
William J. Knott, P.O. Box 279, R.R. No. 3, Richmond, Ind.
Filed Nov. 8, 1971, Ser. No. 196,545
Int. Cl. B28c *5/16;* **B01f** *7/00*
U.S. Cl. 259—178 R **7 Claims**

An apparatus for mixing materials in a tub having a mortar mixer movably mounted to a frame mountable to the tub. A frame is connected to the tub by a pair of clamps which engage the top and bottom edges of the tub. A vertical rod is threadedly received by the frame and is supported thereto by a hollow bearing cylinder fixedly supported above the frame. A sleeve encloses the bottom threaded end of the vertical rod. A horizontal rod is cantileveredly mounted to the vertical rod and slidably receives a carrier. An electric hand drill is suspendedly mounted to the carrier and has a rotatable shaft with a



mixing blade mounted thereto. A blade protector is mounted to the shaft preventing damage to the blade. The carrier is slidable to and from the vertical rod and is rotatably mounted to the horizontal rod. The drill is rotatably mounted about an axis parallel to the horizontal rod and may be swung upwardly to disengage the mixing blade from the tub. A hook is mounted to the vertical rod for locking the drill in the upward position. The vertical rod is rotatable about a vertical axis.

3,722,836
GAS DIFFUSER
Elton S. Savage, Wexford, and Donald F. Heaney, Pittsburgh, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.
Filed June 24, 1970, Ser. No. 49,369
Int. Cl. B01f *3/04*
U.S. Cl. 261—1 **17 Claims**



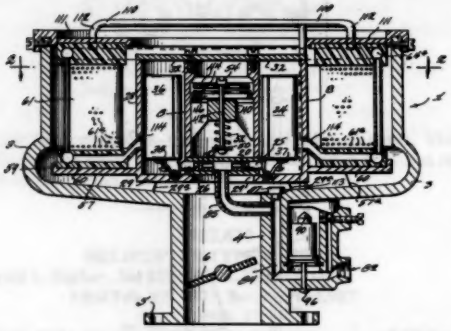
A gas diffuser for admitting gas into a body of liquid is disclosed. The diffuser includes an elongated body with a chamber extending inwardly from an open face thereof and a resilient strip covering the chamber and secured to the body so as to flex at its ends under the urging of the pressure of gas in the chamber. The body includes a pair of cavities adjacent its end walls. The cavities act as resonance chambers causing the gas therein to resonate with the strip as the gas stream flows across the cavities. In addition, the strip is tapered from an intermediate portion thereof to its ends.

3,722,837

CARBURETOR UTILIZING SURFACE TENSION AND CAPILLARY ACTION

William R. Dapprich, P.O. Box 384, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 7,201, Jan. 30, 1970, abandoned. This application April 12, 1972, Ser. No. 243,403
Int. Cl. F02m *17/28*
U.S. Cl. 261—34 A 10 Claims



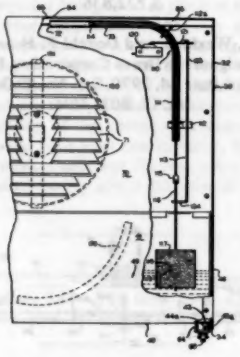
Wet plates or grids with minute perforations are so positioned as to utilize the fuel property of surface tension and capillary action to allow the fuel to form a film over the apertures so that the air pressure differential between the manifold side of the grid and the atmospheric pressure side will stretch the fuel film and encapsulate sufficient air to burn the fuel in the film.

3,722,838

HUMIDIFIER

James A. Swimmer, and Martin Harris, Chicago, Ill.

Division of Ser. No. 887,236, Dec. 22, 1969, Pat. No. 3,637,194. This application Dec. 17, 1971, Ser. No. 209,393
Int. Cl. B01f *3/04*
U.S. Cl. 261—72 R 3 Claims



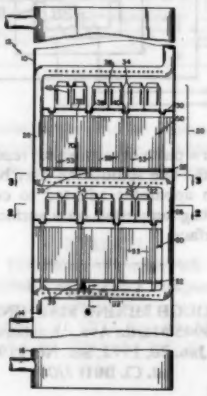
A humidifier comprises a housing formed from prefinished metal sheets in such a manner as to provide a water reservoir, an inclined filter pad carried by a water trough, an impeller disposed below the high point of the filter pad and consisting of a hub carrying a pair of axially spaced plate-like bodies, each of the bodies having two semicircular water-throwing edges of different radii, a ring carried by the impeller and disposed partly in the water reservoir, a two-speed motor for rotating the impeller, and a combined shutoff and indicator apparatus which functions to show the amount of water left in the reservoir and to turn off the motor when the water level drops below a predetermined value.

3,722,839

VAPOR-LIQUID CONTACTING

Alve J. Erickson, Chisholm, Minn., and Thomas W. Mix, Wellesley, Mass., assignors to Merix Corporation, Wellesley, Mass.

Filed July 20, 1970, Ser. No. 56,266
Int. Cl. B01d *47/06, 47/10*
U.S. Cl. 261—111 15 Claims



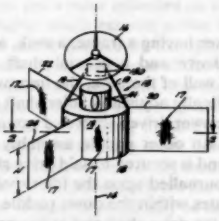
Vapor-liquid contacting device having a contact zone, a separator downstream of the contact zone, and a fluid conduit extending transversely through the interior of the contact zone and having a wall providing openings spaced transversely in the zone for distributing fluid thereinto.

3,722,840

SPIN STABILIZED VEHICLE AND SOLAR CELL ARRANGEMENT THEREFOR

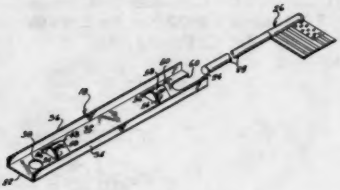
George J. Andrews, Los Angeles, and Harold A. Rosen, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 18, 1969, Ser. No. 886,332
Int. Cl. B64g *1/10*
U.S. Cl. 244—1 SS 1 Claim



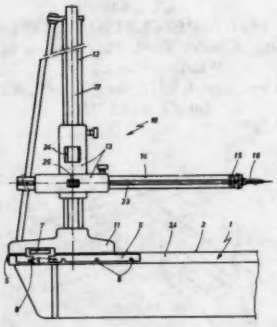
A spin-stabilized vehicle comprising (1) a body and (2) three deployable panels, arranged to present body and panel surfaces covered with photovoltaic or solar cells for increasing the stability and the sun derived power of the craft. The panels are stowed within or wrapped about the craft. The panels are stowed within or wrapped about the craft during ascent towards its utilizable position. When deployed, the panels extend radially from the craft. When extended, the panels are at least as long as the radius of the body. The use of three panels results in a relatively small ripple of the power supplied by the cells as the craft rotates and therefore a relatively high efficiency of cell utilization is provided.

3,722,841
FLAG HOLDER
Quentin P. Ciolfi, 5890 N.W. 114th St., Hialeah, Fla.
Filed April 24, 1972, Ser. No. 247,001
Int. Cl. F16m *13/02*
U.S. Cl. 248—43 **4 Claims**



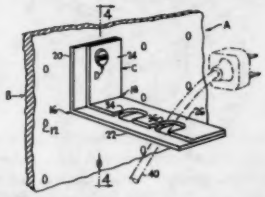
A one piece holder for displaying a flag on a bicycle, for example. The holder includes: an elongate body having at least two spaced aligned socket defining portions each sized to snugly receive and frictionally retain a flag staff in upstanding relation; shield means to protectively partially house the staff of a flag held by the holder; mounting means for attachment of the holder to the threaded distal end of the axle shaft of the rear wheel of a bicycle, or for attachment to a similarly equipped vehicle, the mounting means comprising a through hole in one end of the body sized for passage of the axle shaft to be retained thereon by threaded advancement of a keeper nut; additionally for optional use, quick detach mounting means are provided in the form of a slot in the other end of the elongate body, the slot being sized to receive the axle shaft; and rigidifying means for the body to resist deformation of it in use.

3,722,842
IMPLEMENT FOR MEASURING OR MARKING WORKPIECES
Herman Schweizer, Esslingen, Germany, assignor to C. Stiefelmayer KG, Esslingen, Germany
Filed Feb. 19, 1971, Ser. No. 116,796
Claims priority, application Germany, Feb. 26, 1970, P 20 08 948.9
Int. Cl. G01b *5/00*
U.S. Cl. 248—124 **12 Claims**



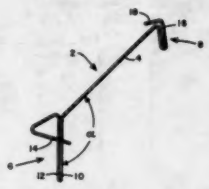
This implement comprises an upright standard and a cross bar which extends at right angles to the standard and is adjustable to different heights along the standard and also in its axial direction so that its tool-carrying end may be extended to different distances from the standard. The invention provides that the cross bar is made of a tubular shape with closed ends which are connected to each other by bracing means, for example, tie rods, which extend longitudinally through the hollow inside of the cross bar and at least one of which is connected to at least one end of the cross bar at a point above the longitudinal axis of the cross bar so that, when this bracing means is tightened on the outside of one end of the cross bar, the tool-carrying part will be given a biasing tension which tends to curve this part upwardly and thereby counteracts the tendency of this part to bend downwardly under its own weight and the weight of the respective tool thereon. This biasing tension of the cross bar may be adjusted in accordance with the weight of the particular tool. By providing several tie rods or similar bracing means within the cross bar and connecting them at different points to the ends of the cross bar, and adjusting them axially to different tensions, the cross bar may also be bent in lateral directions.

3,722,843
DISPLAY FIXTURE FOR PORTABLE ELECTRICAL ARTICLES
Albert J. Enckler, North Olmsted, Ohio, assignor to Keeler & Dunkel, Inc., Cleveland, Ohio
Filed July 19, 1971, Ser. No. 163,914
Int. Cl. A47g *23/02*
U.S. Cl. 248—300 **3 Claims**



A display fixture or device for the public display of one or more portable electrical articles having a permanently attached electric power cord or wire with a connector member of larger diameter than the cord or wire at its free end. The display fixture or device includes a rack or stand-type support having a plurality of circular apertures in a part thereof and an article attaching or security assembly comprising two overlapping plate-like members each having a portion at an angle to another with two portions having notches in their opposite sides for the reception of the cord or wire of an electrical article on display and the other portions detachably connected to one another and to the rack or stand member by a blind fastener or anchor member, the shank of which extends through alignable apertures in the other portions of the plate-like members and an aperture in the rack or stand member.

3,722,844
FISH BASKET SUPPORT
Arthur W. Baker, Rt. No. 1, P.O. Box 844, Excelsior, Minn.
Filed April 13, 1971, Ser. No. 133,544
Int. Cl. A47f *7/00*
U.S. Cl. 248—302 **5 Claims**



A support member for supporting a fish basket from the side of a row boat. The support member is of unitary construction

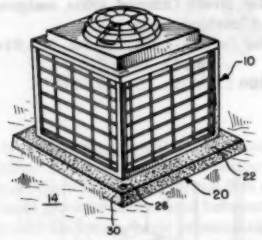
and comprises an elongated rod having one end bent to define a hook portion onto which can be fastened a cord, line or bail secured to the fish basket. The other end of the rod is bent at an obtuse angle and has a pair of closely spaced parallel leg segments with one of the leg segments defining a FIG. 4. The parallel leg segments are adapted to be inserted into an aperture in the gunwale such as the oarlock of the boat. The horizontal portion of the FIG. 4 abuts the gunwale of the boat to prevent rotation of the support member in the oarlock.

3,722,845

GROUND MOUNTING BASE FOR CENTRAL AIR CONDITIONER HEAT EXCHANGER UNITS

Robert M. Unger, 564 Northampton Cir., Elk Grove Village, Ill.

Filed Jan. 22, 1971, Ser. No. 108,909
Int. Cl. F16m *13/00*
U.S. Cl. 248—346 **4 Claims**



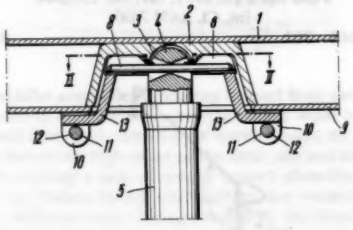
A ground mounting base is disclosed for use with externally mounted heat exchanger units such as the outdoor condenser unit commonly used in residential central air conditioning systems. The base is light weight but strong and comprises a pad of concrete employing vermiculite as its primary aggregate, a wire screening reinforcement, and a top layer of sand aggregate concrete. A bubble level is affixed at the top surface to aid in leveling the base and upward projecting preset mounting bolts affixed therein for receiving and affixing the heat exchanger to the base. The base also preferably has inclined side walls inclining outward from the top to the bottom to aid in preventing horizontal movement after implacement.

3,722,846

CONNECTING MEANS

Werner Albrecht, Herne, Germany, assignor to Klockner-Werke AG, Duisburg, Germany

Filed Feb. 3, 1971, Ser. No. 112,308
Claims priority, application Germany, Feb. 11, 1970, P 20 06 088.2
Int. Cl. E21d *15/55*
U.S. Cl. 248—357 **3 Claims**



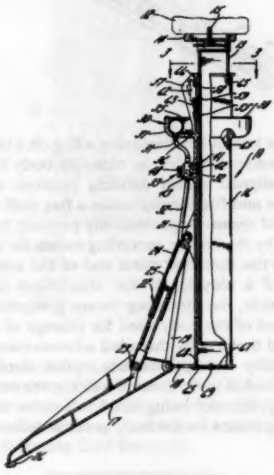
Means for establishing a connection between a support cap and a prop head for pit props of the type used in the mining industry, the support cap comprising a bar or the like supporting an upper bed such as a hanging wall or roof of the mine, and the pit prop constituting a hydraulic cylinder with its ram, or prop head, bracing against the support cap, the connecting means comprising a securing element fixed to the outer free end of the ram and releasably fixed to the support cap.

3,722,847

INSTRUMENT SUPPORT STRUCTURE

Chadwell O'Connor, 3490 E. Foothill Blvd., Pasadena, Calif.

Filed March 1, 1972, Ser. No. 230,699
Int. Cl. F16m *11/38*
U.S. Cl. 248—407 **9 Claims**



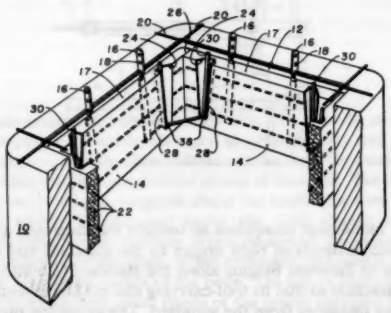
An instrument support structure including a post telescoped in a column, with a lock for adjusting their combined length, and three legs pivoted at the bottom of the column for swinging movement from adjacent the column to extended, base-defining positions. The legs are locked by extendible struts including fluid actuators with one strut interconnecting each leg with the column. Fluid from a reservoir on the column is directed to all actuators when the legs are extended, and then valving is closed to shut off fluid intercommunication and lock the legs. The column and post are triangular in cross section for rigidity. The parts are formed to collapse compactly.

3,722,848

HOT TOP SECURING SYSTEM

James E. Young, Chadds Ford, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 4, 1971, Ser. No. 149,982
Int. Cl. B22d *7/10*
U.S. Cl. 249—197 **5 Claims**



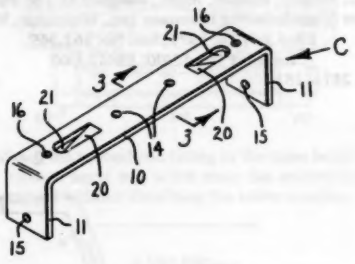
A hot top securing system for securing preformed sideboards within an ingot mold. The securing system employs

end adjacent side boards having grooves therein which form downwardly convergent wedge receiving grooves at each corner of the mold. Each groove comprises a protective liner secured to the sideboard and so formed and oriented that the required downward convergency results. Wedge means, preferably U-shaped spring rods, are inserted base side down between pairs of grooves at each corner to provide the required securing force.

3,722,849
CONCRETE FORM CLIP

William John Luyben, 14005 N.E. Marine Dr., Portland, Oreg.

Filed Nov. 5, 1971, Ser. No. 196,130
Int. Cl. E04g 17/14
U.S. Cl. 249—219 R **9 Claims**



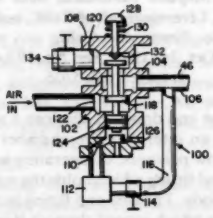
A metal bar has upturned end flanges on opposite ends of a base portion arranged to provide stops against the outward movement of a pair of vertical form panels resting on the clip. Spaced inwardly from said end flanges is a pair of outwardly directed tongues struck out from said base portion in inclined positions with elevated ends spaced from said flanges. The form panels are received in the spaces between the end flanges and the tongues. Panels improperly placed in the mid portion of the clip may be readily pushed out against the end flanges or the pouring of the concrete will push the panels out to their proper positions. The tongues provide sloping ramp surfaces to facilitate the outward movement of the panels.

The clip is also utilized in making forms for the monolithic pouring of a wall and footing. In one embodiment the clip is mounted on stakes in the footing pour area to support the wall form panels. In another embodiment in similar arrangement the clips are made long enough for mounting on the top edges of the footing form panels.

3,722,850
SNAP ACTION VALVE

James M. Kemper, Hollywood, Calif., assignor to Monogram Industries, Inc., Los Angeles, Calif.

Division of Ser. No. 829,486, June 2, 1969, which is a continuation-in-part of Ser. No. 737,232, June 14, 1968, abandoned. This application Nov. 13, 1970, Ser. No. 89,376
Int. Cl. F16k 21/16; E03d 5/016
U.S. Cl. 251—52 **4 Claims**

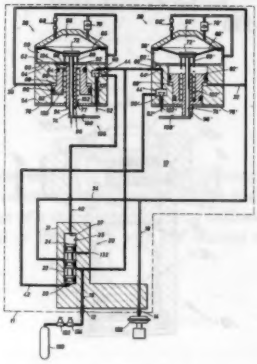


A snap action valve mechanism includes a spool to which is coupled a magnetizable piston. A permanent magnet in a control chamber holds the spool in a first configuration. A pneumatic fluid is applied to the control chamber to act upon the piston, forcing the spool to snap into the second configuration.

3,722,851
TIMING VALVES

Addison N. Love, Houston, Tex., assignor to Harold Brown Company, Houston, Tex.

Division of Ser. No. 821,745, May 5, 1969, Pat. No. 3,653,393. This application July 9, 1971, Ser. No. 161,150
Int. Cl. F16k 31/12
U.S. Cl. 251—54 **8 Claims**

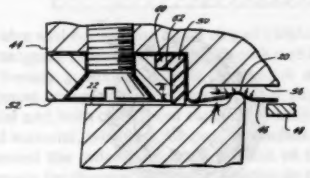


This invention relates to timing valves for controlling the pressure fluid between a supply line and a utilization line servicing one or more pressure utilization devices with pressure signals of adjustable duration and frequency. The operation of a pair of complementary timing valves in connection with a controller is synchronized by the pressure signals applied to the utilization line. One timing valve begins its predetermined delay period on the application of the pressure signal, while the other timing valve begins its delay period on the termination of the pressure signal. Each timing valve includes a time-calibrated variable orifice forming part of a timing chamber which includes fluid which is placed under pressure by a flexible diaphragm. A master control valve coupling the supply line to the utilization line can be controlled by the timing valves and the successive displacements of the diaphragms.

3,722,852
RELIEF VALVE

Walter W. Powell, Houston, Tex., and Dennis L. Howland, Oceano, Calif., assignors to Anderson, Greenwood & Co., Houston, Tex.

Division of Ser. No. 808,797, March 20, 1969, Pat. No. 3,583,432. This application March 12, 1971, Ser. No. 123,762
Int. Cl. F16k 25/00
U.S. Cl. 251—61.2 **5 Claims**



An improved pressure vacuum relief valve having a pressure energized seat, a secondary seat with a stop adapted to be used

with a pilot valve to relieve a vacuum condition and with two pilot valves to relieve pressure and vacuum conditions. This abstract is neither intended to define the invention of the application which, of course, is measured by the claims, nor is it intended to be limiting as to the scope of the invention in any way.

3,722,853

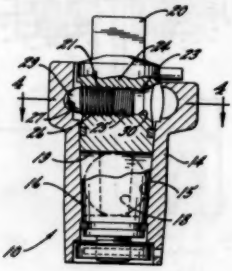
PILFER-PROOF VALVE

Theodore A. Dargatz, and Erwin E. Hirschberg, both of Rockford, Ill., assignors to Eclipse Fuel Engineering Co., Rockford, Ill.

Filed Dec. 8, 1971, Ser. No. 205,992

Int. Cl. F16k *35/06*

U.S. Cl. 251—110 **6 Claims**



A locking screw is threaded into and retained permanently in the valve member of the valve and prevents rotation of the valve member upon being projected into a locked position in response to the turning of a specially designed laterally flexible tool inserted into the valve body and detachably connected in torque-transmitting engagement with one end of the screw.

3,722,854

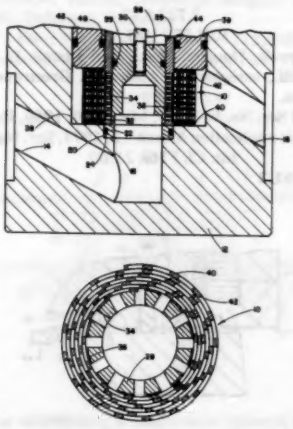
VALVE WITH PERFORATED RIBBON SILENCING ELEMENT

Gary D. Parola, Moraga, Calif., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Dec. 1, 1971, Ser. No. 203,561

Int. Cl. F16k *47/00*

U.S. Cl. 251—127 **9 Claims**



The disclosure is of a silent valve in which outlet flow is in a radial direction. Intermediate the valve closure member and the outlet passage is an annular flow retarding member formed by a coiled ribbon of perforated sheet material wrapped onto itself in several layers with holes therethrough overlapping to form communicating orifices. Preferably, the ribbon is sufficiently thick that the holes form expansion chambers producing further energy loss. Holes across the width of the ribbon are uncovered progressively as the closure member moves toward open position.

3,722,855

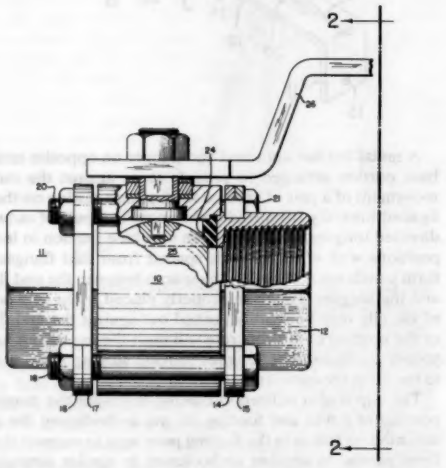
BETWEEN FLANGE VALVE ASSEMBLY AND CLAMPING MEMBER

Roger G. Massey, Holden, Mass., assignor to The Parker and Harper Manufacturing Company Inc., Worcester, Mass.

Filed July 14, 1971, Ser. No. 162,369

Int. Cl. F16k *51/00*; **F16l** *23/00*

U.S. Cl. 251—151 **4 Claims**



A replaceable valve assembly secured into position by paired clamp members which engage flange members on either side of the valve and are bolted together by a plurality of bolts which engage only the clamp members themselves. The clamps are removable independently by removal of one of the bolts.

3,722,856

BALL VALVE WITH SEPARABLE END FITTING

Ulrich H. Koch; Stephen Matousek, both of Moraga, and Gary Soderlund, Livermore, all of Calif., assignors to Whitye Research Tool Co., Emeryville, Calif.

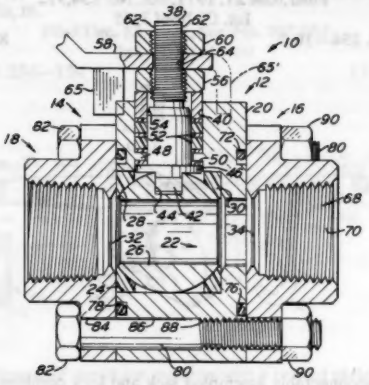
Filed Oct. 26, 1971, Ser. No. 192,493

Int. Cl. F16k *5/06*

U.S. Cl. 251—152 **4 Claims**

The specification and drawings disclose a valve including a main body having an internal valve chamber connected with first and second flow passages. Cooperating with the first flow passage is a first end fitting which holds the valve member and seats in the main body. The first end fitting is connected to the main body by bolts which extend through it into threaded engagement with the body. Threaded end portions of the bolts extend outwardly of the body adjacent the second passage. A second end fitting cooperates with the second passage and in-

cludes openings through which freely pass the threaded end portions of the bolts. Nuts are threaded on the outer end of the

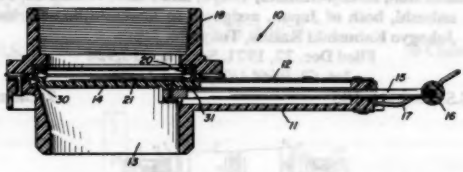


bolts to clamp the second end fitting to the main body. This allows the valve to serve as a union since the second end fitting can be removed without disturbing the valve member.

3,722,857
GATE VALVE

Charles L. Townsend, 2 Corwin Road, Penfield, N.Y.

Continuation of Ser. No. 828,396, May 27, 1969, abandoned. This application April 19, 1971, Ser. No. 135,366
Int. Cl. F16k *25/00*
U.S. Cl. 251—203 **3 Claims**



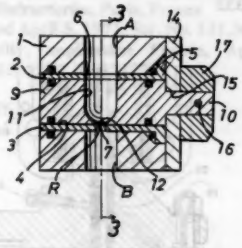
A sliding gate valve has an improved seal and a cammed gate that cooperate to provide better sealing, along with easier operation and a gate of lighter construction. The improved seal is a flexible annular lip around the valve passageway having a ridge engaged by the gate and surfaces on opposite sides of the ridge inclined upward away from the gate for easy camming of the gate into engagement with either side of the ridge. The cammed gate includes cam followers on the gate and cams in the valve housing for forcing the gate against the seal as the gate nears its closed position.

3,722,858
FLOW REGULATING DEVICE

Masashi Sugimoto, Nagoya, and Yoshiki Moriyama, Okazaki, both of Japan, assignors to Norio Nomura, Anjo-shi, Japan

Filed Dec. 15, 1970, Ser. No. 98,311
Claims priority, application Japan, Dec. 29, 1969, 44/1407
Int. Cl. F16k *5/10, 5/18*
U.S. Cl. 251—209 **5 Claims**

A flow regulating valve for hydraulic systems including a housing having inlet and outlet ports and a port crossing bore, a sleeve mounted in the bore of the housing and provided with a first opening communicating with the inlet port and a second opening on the opposite side communicating with the outlet port, the walls of the second opening forming knife edges at the inner surface of the sleeve and sloping outwardly to the outer surface of the sleeve, a throttle spool mounted in the sleeve and provided with a cavity of decreasing size communicating at its larger end with the first opening of the sleeve

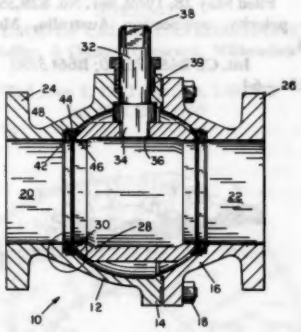


and at its smaller end with the second opening of the sleeve, and means for relatively moving said sleeve and throttle spool to adjust the size of a sharp-edged orifice defined by overlap of the smaller end of the cavity with the second opening of the sleeve.

3,722,859
BALL VALVE SEAL FOR HIGH TEMPERATURE OPERATION

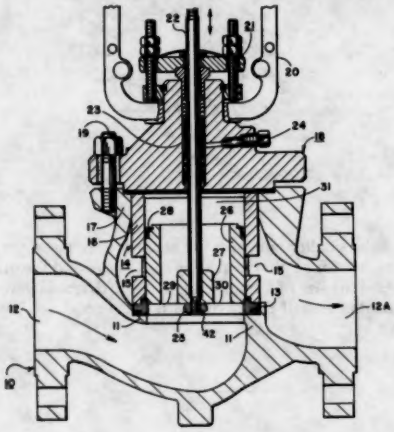
Francis E. Murphy, Greensburg, and William L. Kane, Trafford, both of Pa., assignors to Walworth Company, Bala Cynwyd, Pa.

Filed March 22, 1971, Ser. No. 126,848
Int. Cl. F16k *5/06*
U.S. Cl. 251—315 **10 Claims**



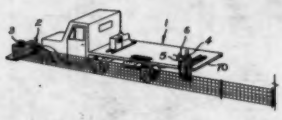
A ball valve seal comprising a seal ring of yieldable material and of rectangular cross-section, though with one inner corner removed leaving a conical sealing surface. A seat ring assembly almost completely contains the seal ring, engaging both readial and both cylindrical surfaces to inhibit cold flow of the seal material, with just the conical surface exposed. A groove around the outer cylindrical surface of the seal ring provides space for thermal expansion relative to the seat ring. A back seal ring, which seals around the seat ring, has an internal conical surface that engages a complementary surface on the seat ring assembly whereby hoop tension provides a spring force under axial load.

3,722,860
CAGE VALVE ASSEMBLY
John R. Curran, Attleboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Continuation of Ser. No. 42,426, June 1, 1970, Pat. No. 3,648,718. This application Dec. 9, 1971, Ser. No. 206,248
Int. Cl. F16k 39/04
U.S. Cl. 251—332 3 Claims



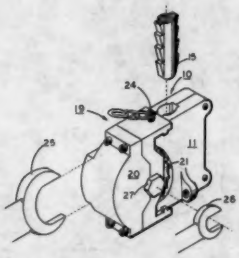
A simplified industrial process control valve utilizing a cage guided plug having an easily replaceable soft seat, two gasket construction, improved plug rim seal and an unpinned stem and plug assembly to provide bubble-tight shut off.

3,722,861
FENCING
Colin C. Anderson, 111 Kengington Rd., Norwood, Australia
Filed May 28, 1969, Ser. No. 828,598
Claims priority, application Australia, May 30, 1968, 38586/68
Int. Cl. B65h 75/30; B66f 3/00
U.S. Cl. 254—64 9 Claims



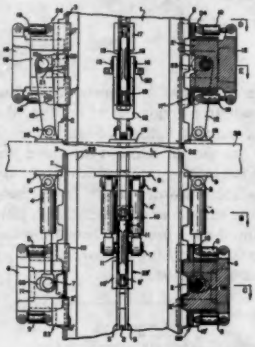
The disclosure relates to a fencing device in which a transport moves along the line of fencing and feeds the wires which are to form the line of fencing under tension once fencing is commenced. The posts are positioned by driving means along the line of strip wire and the wires are tied to the posts while the tension is maintained. The tension is maintained by braking means either on a drum which carries the wire or on separate means over which the wire passes and the tension means are so arranged that the force on this tension drum or means is measured by springs so arranged that the brakes are applied until the required tension is reached whereupon the brakes are progressively released to maintain the tension, control being such that the tension is maintained whether the vehicle moves forwardly during the playing out of the wire or is stationary during the driving of the posts.

3,722,862
JACK AND LOCK
Samuel L. Dolce, 1421 North Kirby Drive, La Habra, Calif.
Filed June 21, 1971, Ser. No. 154,912
Int. Cl. B66f 3/08
U.S. Cl. 254—10.5 8 Claims



A disconnectably assembled jack and lock combination. A unidirectionally adjustable lock, including a movable tongue having a longitudinal axis, further includes a longitudinally restrained, springloaded means adapted to cooperate with the tongue for checking longitudinal motion thereof in a preselected one of two opposed directions parallel to the longitudinal axis. A jack having a rotatably mounted pinion is adapted to engage the tongue for preselected unidirectional translation in a record of the two opposed directions. The jack and lock are keyed laterally of the longitudinal axis and parallel to the axis rotation of the pinion, whereby the jack and lock may be disconnectably engaged for cooperation.

3,722,863
LIFT APPARATUS
Isamu Itoh, Koenji-Minami, Tokyo, and Fumio Nakazono, Funabashi, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Dec. 22, 1971, Ser. No. 210,924
Int. Cl. B66f 1/00; E02d 21/00
U.S. Cl. 254—105 2 Claims



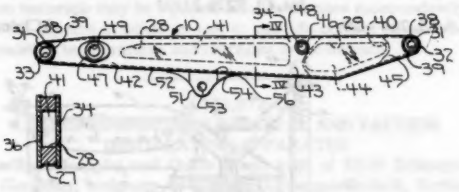
When a plurality of hydraulic cylinders are actuated for lifting or lowering a platform, the platform and the load applied to it are supported by a plurality of locking plates coupled to the cylinders and each having a plurality of trapezoidal teeth in engagement with the similar teeth of a rack attached to a post along which the platform is lifted or lowered. Lever means are provided for locking in position the platform for a long time even when the hydraulic pressure is not applied to the locking cylinders which cause said locking plates to engage with the racks.

3,722,864

COMPOSITE STRUCTURAL MEMBER

Herbert W. Borer, Naperville, and Arthur R. Shaff, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 13, 1971, Ser. No. 207,153
Int. Cl. B66f 3/00
U.S. Cl. 254—124 11 Claims



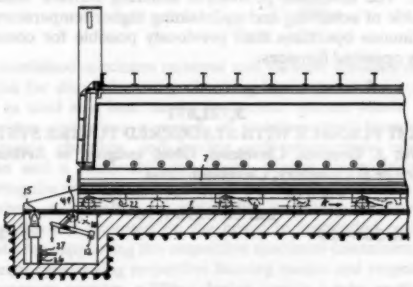
An elongated structural member with a central plate having apertures therein intermediate the ends thereof and having side plates secured thereto forming a laminated construction whereby the side plates and apertures form cavities within the structural member to provide a hollow, box-beam cross section for a portion of the length thereof in the areas of minimum stress and to provide solid sections in areas of maximum stress.

3,722,865

WALKING BEAM FURNACE

Herder Storck, Duesseldorf-Heerdt, and Werner Erhard, Kleinenbroich, both of Germany, assignors to Koppers-Wistra-Ofenbau Gesellschaft mit beschraenkter Haftung, Duesseldorf-Heerdt, Germany

Filed March 22, 1971, Ser. No. 126,648
Claims priority, application Germany, March 21, 1970, P 20 13 580.2
Int. Cl. F27b 9/24
U.S. Cl. 263—219 10 Claims



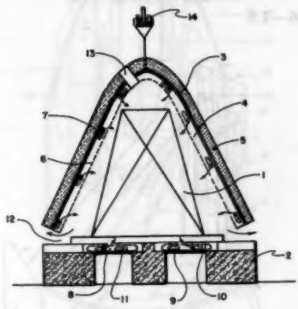
In a walking beam furnace there is provided at least one lower and at least one superposed upper walking beam support frame. These are mounted for relative vertical as well as longitudinal movement. Components having upwardly inclined surfaces are interposed between the frames with which they cooperate so as to effect relative vertical displacement of the upper frame with reference to the lower frame when the frames are moved longitudinally relative to one another. A rack is fast with the lower frame and a stationarily mounted gear cooperates with this rack to cause longitudinal displacement of the lower frame. Another rack is fast with the upper frame and an engaging arrangement is provided, including a stationary upright hollow guide member located beneath the upper frame, an upright support which is guided in the guide member for vertical movement, a gear wheel turnably carried by the upright support and camming with the rack on the upper frame, and a biasing arrangement such as a counterweight which permanently urges the gear wheel into engagement with the rack on the upper frame.

3,722,866

APPARATUS FOR FEEDING A GAS FURNACE

Claude Herzberg, Bron, France, assignor to Societe Generale Des Produits Refractories, Paris, France

Filed April 5, 1971, Ser. No. 131,365
Claims priority, application France, April 3, 1970, 70/12124; April 3, 1970, 70/12127
Int. Cl. F27b 3/02
U.S. Cl. 432—175 8 Claims



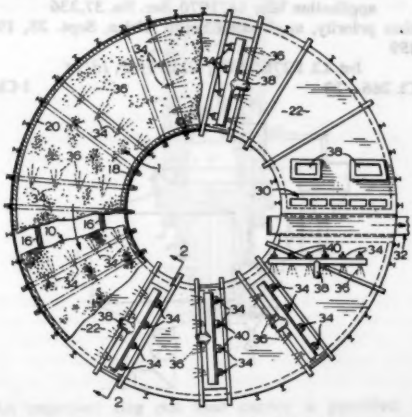
A method and apparatus for providing substantially uniform temperature in a furnace or kiln heated by combustion of an air-fuel mixture. A distribution chamber is provided having at least one permeable wall adjacent the combustion chamber. The permeable wall comprises a refractory material, either fabric or felt, of ceramic fibers. The air-fuel mixture is introduced into the distribution chamber at a pressure in excess of that in the combustion chamber. In this way the air-fuel mixture slowly passes through the permeable wall and is ignited and burned over a large area within the combustion chamber.

3,722,867

METHOD OF CALCINING LIMESTONE

William D. Butler, 4 Quincy Crescent, Willowdale, Ontario, Canada

Filed June 1, 1971, Ser. No. 148,342
Int. Cl. C04b 1/00
U.S. Cl. 423/175 2 Claims



This invention is concerned with a continuous method of calcinating limestone in a chamber having refractory walls and

a refractory hearth movable through said chamber comprising the steps of depositing the limestone in a layer on the hearth, heating the limestone above 1600° F. as the hearth moves through chamber by directing burning gases against the surface of the layer and downwardly into the limestone and against the hearth, evacuating CO_2 and other gases released from the limestone and gas combustion from said chamber and removing the limestone from the hearth.

3,722,868

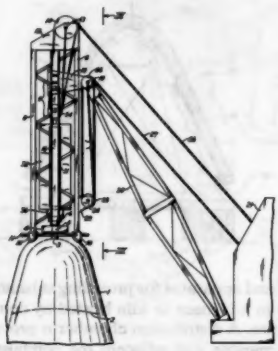
APPARATUS FOR DISLODGING SKULLS FROM SLAG OR CINDER LADLES

Richard K. Jones, 347 Thompsonville Road, McMurray, Pa.

Filed Aug. 24, 1971, Ser. No. 174,352

Int. Cl. C21b 7/14

U.S. Cl. 266—1 S **8 Claims**



An inverted ladle, in which a skull is stuck, is provided with a vertical hole through its upper end. Inserted in this hole is a pin that extends above the ladle. A power hammer that has been lowered close to the upper end of the pin is then operated to drive the pin down into the ladle in order to knock the skull loose from inside the ladle. The power hammer operates in a framework temporarily resting on the ladle around the pin.

3,722,869

SEGREGATION APPARATUS

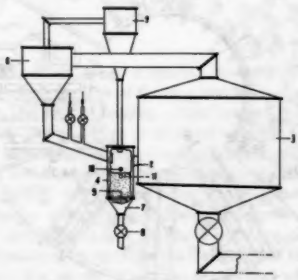
Victor J. Moore, Nkana East, Zambia, Republic of South Africa, to Anglo American Corporation of South Africa Limited, Johannesburg, Republic of South Africa

Division of Ser. No. 670,620, Sept. 26, 1967, abandoned. This application May 14, 1970, Ser. No. 37,336

Claims priority, application South Africa, Sept. 28, 1966, 66/5859

Int. Cl. F27b 21/00; C21b 1/02, 13/14

U.S. Cl. 266—20 **1 Claim**



In the process of U.S. Pat. No. 3,300,299, material in the chamber through which continuous plug flow takes place is caused to oscillate in level, in response to pressure probe measurements, either by intermittently discharging from the chamber or by varying the rate of discharge between a level which is higher than the rate of inflow into the chamber and a level which is lower than that rate of inflow.

3,722,870

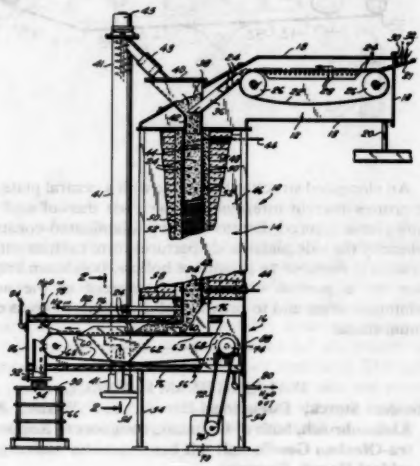
METHOD AND FURNACE FOR SINTERING

John F. Griffin, 121 Carey Avenue, Meriden, Conn.

Filed May 20, 1970, Ser. No. 38,937

Int. Cl. F27b 21/00

U.S. Cl. 266—20 **4 Claims**



A method and furnace are disclosed for continuous sintering powdered metal products. The furnace includes a high temperature heating zone through which the powdered metal products pass for sintering. The high temperature heating zone includes a thermally stable medium preferably alumina sand, in which the sintered product is carried through the furnace. The invention provides a sintering furnace which is capable of achieving and maintaining higher temperatures in continuous operation than previously possible for commercially operated furnaces.

3,722,871

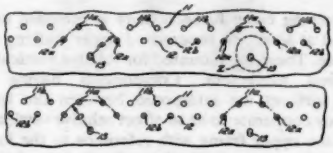
BLAST FURNACE WITH STAGGERED TUYERE SYSTEM

Melvin J. Greaves, Cleveland, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio

Filed Oct. 15, 1970, Ser. No. 80,907

Int. Cl. C21b 7/16

U.S. Cl. 266—29 **3 Claims**



Tuyere systems for blast furnaces are disclosed embodying two or more rows of tuyeres, to provide increased capacity for injection of blast air and for injection of materials to control temperatures and reactions inside the blast furnace. The increased capacity provided by more than one row of tuyeres

makes possible the introduction of air and injected other materials in sufficient quantities to provide desired temperatures and reactions, and efficient operation of blast furnaces of exceptionally large diameters. The tuyeres are disclosed as arranged substantially equidistantly from the iron notch to make possible equalization of heating around the notch, and to minimize hazardous conditions. At least four iron notches are utilized, and advantageous processes are disclosed for withdrawing iron through the iron notches. Tuyeres in the multiple rows may be divided into groups through which injection materials may be injected into the furnace independently of the tuyeres in other groups to provide control of internal condition temperatures and reactions in the furnace.

3,722,872

COMBINED SPECIMEN REMOVAL AND VACUUM DISTILLATION APPARATUS

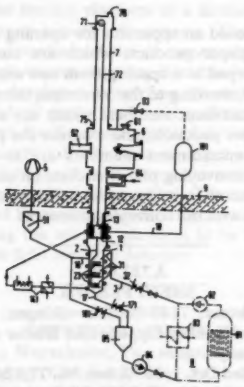
Heribert Jentges, and Oskar Burz, both of 8520 Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Oct. 30, 1970, Ser. No. 85,320

Claims priority, application Germany, Nov. 7, 1969, P 19 55 988.7

Int. Cl. C21c 7/00

U.S. Cl. 266—34 R **10 Claims**



A combined specimen removal and vacuum distillation apparatus for discontinuously checking liquid metal for purity, such as used as a heat carrier in nuclear reactor plants. The apparatus comprises a vessel of stainless steel forming a processing chamber and having wall-temperature control means and a removable top cover, means for positionally securing the cover on the vessel against excess pressure in the chamber, a plurality of removable specimen containers, holder devices mounted on the cover in suspended relation thereto for supporting the respective specimen containers, the holder means having respective heating means and respective temperature sensors, a lifting device having a tube vertically extending above the cover and tightly joined with the vessel chamber, a lifting mechanism disposed in the tube and connected to the cover for lifting the cover and the specimen containers, and a glove box and a specimen sluice interposed between the vessel and the tube of the lifting device.

3,722,873

METHOD AND APPARATUS FOR REFINING MOLTEN METAL

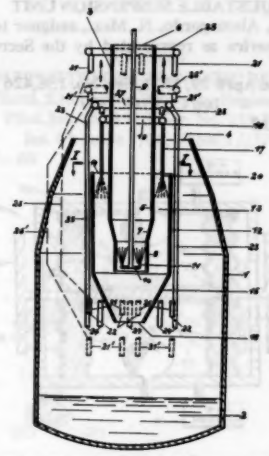
Walter Von Haumeder, Mozartstrasse 6, Essen, Germany

Division of Ser. No. 16,684, March 5, 1970. This application June 11, 1971, Ser. No. 152,383

Int. Cl. C21c 7/00

U.S. Cl. 266—34 L **6 Claims**

Molten metal, particularly pig iron, is refined by oxygen supplied to the melt substantially in the form of liquid metal oxides. Refining gas, preferably high purity oxygen, blown above the melt surface entrains slag and pulverulent additives to form a refining jet in which a substantial part of the oxygen reacts to form liquid metal oxides which refine the melt under controlled endothermal conditions. A foamed slag is prepared during the first phase of the refining operation by blowing refining gas above the surface of the melt while injecting pow-



dered lime in a stream of refining gas into and through a combustion chamber located above the slag surface, in which the heat liberated by reaction of the exhaust gases drawn in from the converter is absorbed by the lime particles traveling through the chamber on their way to the slag. During the second phase of the process pulverulent cooling additives such as sponge iron are added in the same manner.

3,722,874

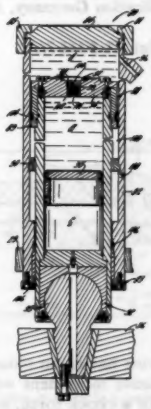
SLAG POT CARRIER

Edward S. Kress, 4009 Brookdale Pl., Peoria, Ill.

Filed Dec. 15, 1970, Ser. No. 98,306

Int. Cl. F16l 5/00

U.S. Cl. 267—64 R **2 Claims**



An improved slag pot load carrier is provided. Fluid powered means are included to assist the primary dump mechanism in moving a vehicle load pivoted on the main vehicle frame from a carry to a dump position, and to return the

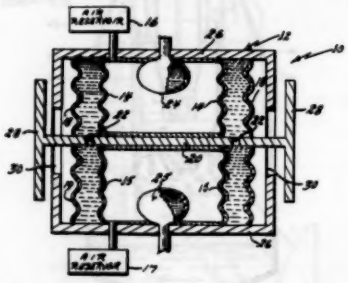
load to its carry position. Suspension means are provided to lower and raise at least a portion of the vehicle frame and to resiliently support the frame against shocks. A hydro-pneumatic system is also provided to appropriately actuate the suspension means, and the primary dump and return assist mechanisms.

3,722,875

ADJUSTABLE SUSPENSION UNIT

Hans O. Hasse, Alamogordo, N. Mex., assignor to the United States of America as represented by the Secretary of the Air Force

Filed April 29, 1971, Ser. No. 138,426
Int. Cl. F16k 5/00
U.S. Cl. 267—122 10 Claims



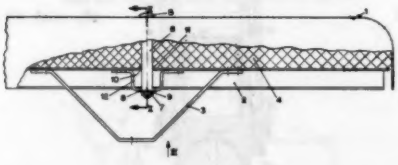
An adjustable suspension unit having an outer housing encompassing a pair of counteracting bellows which are surrounded by a pair of damping bellows, respectively. Separating one set of counteracting and damping bellows from the other set of counteracting and damping bellows, is a middle plate utilized for supporting the equipment to be suspended. By regulating the volume and pressure within the counteracting bellows, the load carrying capacity and spring stiffness of the unit can be easily adjusted. Adjustment of the damping bellows can also be performed if necessary.

3,722,876

SHOCK ABSORBING DEVICE ESPECIALLY FOR VEHICLES

Kurt Schwenk, 318 Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed April 8, 1971, Ser. No. 132,448
Claims priority, application Germany, April 9, 1970, P 20 16 855.2
Int. Cl. F16f 7/12
U.S. Cl. 267—140 20 Claims



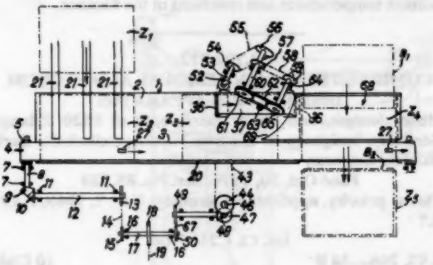
Shock absorbing device having an outer and an inner section supported for relative movement with respect to each other in the direction of a chock force, an intermediate section placed into the space formed by the outer and inner sections and comprising a material having volume-elastic properties, the elastic material is treated with a material having adhesive properties for delaying the return of it into the original position due to its elastic properties after s shock force causing compression of the elastic material has ceased.

3,722,877

APPARATUS FOR OPENING FOLDED, BOUND, MULTIPLE-SHEET PAPER PRODUCTS

Jakob Wetter, Wetzikon, Switzerland, assignor to Ferag, Fehr & Reist AG, Hinuri, Switzerland

Filed Dec. 28, 1970, Ser. No. 101,456
Claims priority, application Switzerland, Jan. 9, 1970, 278/70
Int. Cl. B65h 5/30
U.S. Cl. 270—57 11 Claims



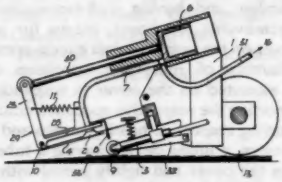
There is disclosed an apparatus for opening folded, bound, multiple-sheet paper products which are continuously advanced or conveyed at a spacing from one another at a conveying device. According to the invention, there are provided two driven entrainment members which act at opposite flat sides of the paper products, and wherein the paths of movement of these entrainment members are at least partially disposed in the conveying plane, enclose an acute angle with respect to one another, and possess a directional component which coincides with the conveying direction.

3,722,878

SHEET FEEDER

Hermann F. Kistner, 7141 Neckarweihingen, Germany, assignor to Maschinenbau Oppenweiler Binder & Co., Oppenweiler, Germany

Filed Oct. 1, 1970, Ser. No. 77,124
Int. Cl. B65h 3/08
U.S. Cl. 271—31 7 Claims



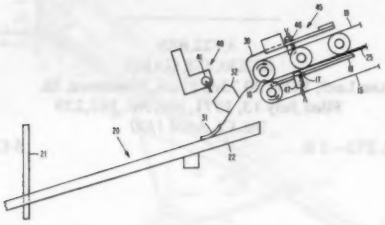
A sheet feeder having a conveyer for feeding sheets spread apart so that the corresponding transverse edges of adjacent sheets overlap each other; a singling station at the front end of the conveyer; a separating mechanism above the conveyer and preceding the singling station and comprising a suction head for lifting the rear edge portion of the leading sheet; and a separating blower for blowing an air current between the lifted rear edge of the leading sheet and the next lower sheet; and control means for the separating mechanism comprising a feeler element adapted to engage with a transverse edge portion of the leading sheet and to insure that this sheet will not be sucked up by the suction head until its front edge is located at the singling station.

3,722,879

CONTROL APPARATUS FOR DOCUMENT STACKERS

David L. Johnston, and Marvin E. Nyberg, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed March 6, 1972, Ser. No. 231,936
Int. Cl. B65h *31/00, 7/02*
U.S. Cl. 271—47 7 Claims



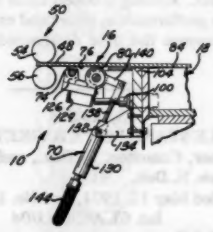
A document level sensor for controlling movement of a platform as documents stack thereon. A document tail kicker carries a shutter plate for blocking light normally impinging upon a light sensitive detector. A document sensor is placed upstream of the stacker platform at a distance less than the minimum distance between documents. The outputs of the light sensitive detector and the document detector are connected to a logic circuit requiring simultaneous outputs from each so as to develop a signal for actuating a motor. The motor drives a lead screw for lowering the stacker platform. The logic circuit also detects a stacker full or stacker jam condition. The stacker full condition is detected by sensing the output of the light sensitive detector, the output of the document detector and a lower limit switch. The stacker jam condition is detected by sensing the occurrence of two successive signals directing the stacker platform to be lowered and an output from the light sensitive detector.

3,722,880

DETECTOR ASSEMBLY

Earl D. Harris, Warminster, Pa., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed April 14, 1971, Ser. No. 133,822
Int. Cl. B65h *5/06, 7/00*
U.S. Cl. 271—51 16 Claims



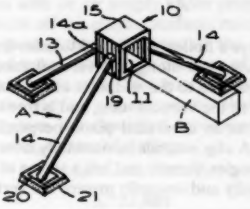
An improved apparatus for operating on sheet material includes a machine having a carriage which moves a sheet during work operations and then deposits the sheet at an unloading location. A detector assembly detects when a trailing end portion of a sheet is moved from the unloading location by an unloader assembly and thereupon provides a signal to initiate operations of the machine on a next succeeding sheet. The detector assembly includes a piston and cylinder biasing assembly which moves a detector roller from an inactive position to an active position in which the detector roller is pressed against a sheet. When the trailing end of the sheet leaves the unloading location, the biasing assembly swings the detector roller upwardly to an actuated position. As the detector roller moves to the actuated position, a switch is closed to provide a signal indicating that the sheet has been removed from the unloading location. The force with which the detector roller is urged upwardly by the biasing assembly can be adjusted so that the roller is pressed upwardly with a relatively large force against heavy sheets of material and is pressed upwardly with a relatively small force against light sheets of material.

3,722,881

SUPPORTS FOR GYMNASTIC BEAM

Donald R. Vilotti, 535 Corbitt Drive, Burlingame, Calif.

Filed Jan. 20, 1972, Ser. No. 219,288
Int. Cl. A63b *1/06;* F16m *11/32*
U.S. Cl. 272—60 5 Claims



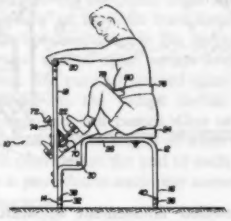
Supports for gymnastic beam wherein a pair of stand-like supports are provided, each having a cap formed with a socket into which an end section of a gymnastic beam may be telescoped, with tripod legs fixed to each of the caps to support the beam at a desired height above the floor or ground, with the tripod legs retaining the beam against endwise and lateral movements while a person performs various acrobatic stunts on the beam.

3,722,882

EXERCYCLE WITH INTERACTING WAIST BELT

Harris W. Patrick, 2491 State Road 84, Fort Lauderdale, Fla.

Filed Sept. 27, 1971, Ser. No. 184,070
Int. Cl. A63b *23/04, 23/02*
U.S. Cl. 272—73 8 Claims

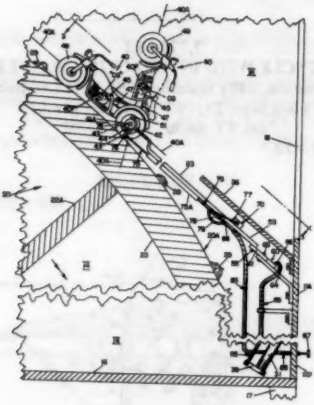


Exercising apparatus in which a person seated on a seat of the apparatus grasps a handle directly in front of him and at the same time pedals a pedalling device with his feet stretched horizontally out in front of him. A waist belt is provided to be struck by the thighs of the person when pedalling and wearing the belt about his waist in order to exercise the waist. The handle and the pedals are adjustable vertically.

3,722,883
CHILD'S SWING
Joseph O'Dowd, Jersey City, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Oct. 13, 1971, Ser. No. 188,916
Int. Cl. A63g 9/00
U.S. Cl. 272—85 3 Claims

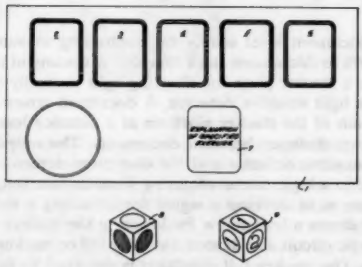
A swing employs a hollow U-shaped tubular frame having a top horizontal tube. An elongated vertical tube is pivotally secured at its upper end to the midpoint of the horizontal tube. A seat is secured to the vertical tube, and is free to swing back and forth below an in a vertical plane perpendicular to the horizontal tube. A clip extends horizontally over the horizontal tube at right angles thereto and has a spring at each end extending downwardly and inwardly toward the vertical tube.

3,722,884
FRONTALLY RAISEABLE VEHICLES AMUSEMENT APPARATUS
Richard L. Brown, Bellevue, Nebr., assignor to Bally Manufacturing Corp., Chicago, Ill.
Filed Sept. 29, 1971, Ser. No. 184,813
Int. Cl. A63f 9/14
U.S. Cl. 273—1 E 11 Claims



There is provided amusement apparatus comprising a miniature simulated vehicle positioned within an upright hollow housing, and remotely controllable by a rearwardly externally positioned operator, the apparatus vehicle simulating the front-end raising or "wheelie" effect of a typical land-vehicle as it might rapidly traverse inclined or uneven terrain whereby pronounced vertical accelerations are subjectable thereto (and especially evident at the land-vehicle's forward-portion). The amusement apparatus also preferably includes a simulated-terrain drum located within the housing frame, means a drive wheel on the the vehicle frictionally engaging the drum for causing relative longitudinal velocity between the simulated-terrain and vehicle, protuberences on the drum extending between the vehicle and the simulated-terrain for vertically upwardly accelerating the vehicle such that the forward-portion thereof pivots upwardly, or "wheelies," about its rear-ward-portion, and operator remote control steering linkage to steer the vehicle around the protuberances or preventing, or at least minimizing, vertical accelerations to the vehicle forward-portion, and a cable for rehabilitating an immobilized upended vehicle.

3,722,885
EXERCISE GAME
Carol Ann Leaf, 18W130 73rd Place, Westmont, Ill.
Filed July 13, 1971, Ser. No. 162,229
Int. Cl. A63f 1/00
U.S. Cl. 273—1 R 5 Claims

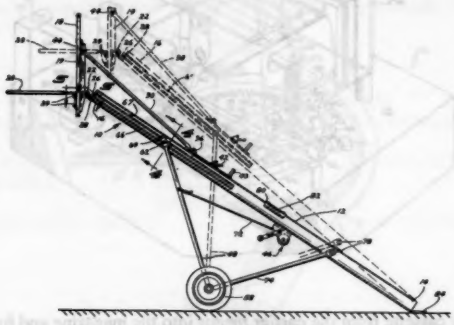


A game wherein provision is made for the chance designation of the character and duration of performance of an exercise selected from a group of exercises designed to condition the body of the player in five important physical fitness component areas including cardiovascular endurance, flexibility, agility, balance and strength. Instructions for the performance of these exercises are imprinted on one side of cards of various colors which are arranged colored side up in piles relating to the various physical components for which the described exercise is designed. Special dice are provided, one having color designations which indicate the pile from which the player shall select a designated exercise and the other having numerals to indicate the period of time to be devoted for the performance thereof. Scoring is based upon the judgment of the instructor as to performance, effort and endurance. A timer is provided to measure the time designated by the cast of the numbered die.

3,722,886
MOVABLE STAND FOR A BASKETBALL GOAL
George A. Sinner, Casselton, N. Dak., assignor to Teamakers, Inc., Casselton, N. Dak.
Filed May 11, 1971, Ser. No. 142,234
Int. Cl. A63b 63/04
U.S. Cl. 273—1.5 R 17 Claims

A stand for a basketball goal has as its main member an elongated tube which, at one end, has a basket and a backboard mounted thereon and which runs at an inclined angle of roughly 30° to 45° from that point to a ground supported end. The tube is supported at its mid-portion by a movable carriage so that the basket and backboard are removed far enough from the carriage to provide the players with a relatively large run-under room. The tube running at an inclined angle from the backboard to the ground provides a relatively great effective longitudinal dimension of the stand which creates a rigid and firm support for the backboard which will have relatively little give or springiness. A winch

mechanism is provided to raise and lower the basket and backboard and means is provided for adjusting the backboard to remain vertical with respect to the ground as the height is adjusted. At the ground supported end of the tube means is



provided so that the stand may be secured to a motor vehicle or bolted to a solid surface. The lower end of the tube may be filled with any suitable ballast material to add mass and increase stability.

3,722,887

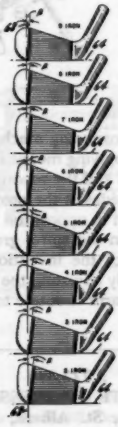
CORRELATED SET OF CLUBS WITH INDICATOR LINE

Alastair J. Cochran, Sutton, Coldfield, England; John W. Jepson, Marion, Mass.; Edward R. Woolley, Rancho Santa Fe, Calif., and Francis deS. Lynch, Mattapoisett, Mass., assignors to Acushnet Company

Division of Ser. No. 146,255, May 24, 1971. This application Nov. 16, 1971, Ser. No. 199,285

Int. Cl. A63b *53/00*

U.S. Cl. 273—77 A **5 Claims**



In a correlated set of golf clubs at least one visible indicator line on the striking face of each club head is provided. This indicator line lies in the loft plane of the club head and is in a predetermined angular relationship with a second line, real or imaginary, and being perpendicular to a third line, real or imaginary, formed by the intersection of the loft plane and the plane on which the club is placed in its normal position for striking a golf ball. The angular relationship is a certain degree for each successive club in the set.

3,722,888

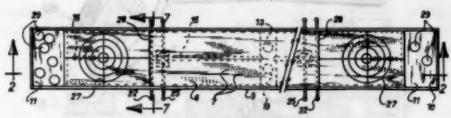
AIR CUSHION GAMES

Jacques Ducharme, 5891 de Normanville St., Montreal, Quebec, Canada

Filed April 29, 1971, Ser. No. 138,630

Int. Cl. A63f *7/00*

U.S. Cl. 273—126 R **7 Claims**



Games of the type in which playing pieces are slid over a playing surface characterized in that the panel forming the playing surfaces is provided with a great number of holes in communication with an air supply under pressure which lifts the playing pieces off the playing surface, resulting in very little friction opposing the movement of the playing pieces. Means are provided to control the pressure of the air supplied to the through bores in order to adjust the coefficient of friction between the playing pieces and the playing surfaces. A few types of games are described incorporating the above principle, including a game of curling.

3,722,889

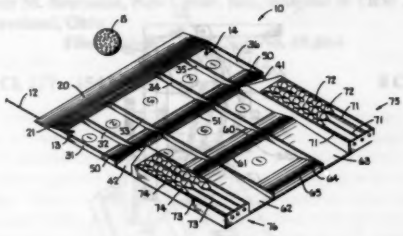
PORTABLE PUTTING GAME DEVICE

W. Curtis Miller, 1005 Jameson Ct., New Castle, Ind.

Filed April 28, 1972, Ser. No. 248,530

Int. Cl. A63b *57/00*, *67/02*

U.S. Cl. 273—176 F **17 Claims**



Portable golf putting apparatus including two rectangular plastic putting targets spaced apart from each other a suitable putting distance and having their side edges arranged along a straight line defined by an inelastic cord having its opposite ends secured to keyhole openings in the targets. Each target includes four parallel spaced-apart ramps over which a golf ball may be putted. Six parallel spaced-apart partitions extending perpendicular to the ramps define five channels through which the putted ball passes. One or more scoring pockets are located along the length of each channel and a ball exit opening is provided at the end of each channel. A set of counting beads is provided at each rear corner of the target, to facilitate keeping score.

3,722,890

GOLF CLUB SWING TRAINING DEVICE

Richard A. Wieboldt, 1623 Ora Drive, Napa, Calif.

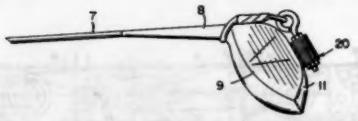
Filed Nov. 20, 1970, Ser. No. 91,443

Int. Cl. A63b *69/36*

U.S. Cl. 273—186 A **1 Claim**

For use with a golf club having a shank and a head there is provided a loop having a bight large enough to slip over the shank but not large enough to pass over the head. The loop is

flexible and is connected by an articulation to a body having a substantial weight and preferably of a material making an audible click when the body strikes the club sole at the end of



the backswing. The weight body may take the form of a threaded eye bolt including a pair of lock nuts between which a plurality of washers are clamped.

3,722,891

SOUND REPRODUCING DEVICE FOR TOYS

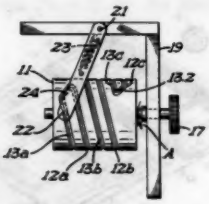
Waldemar Hiller, Maastricher Str. 26, Cologne, Germany

Continuation-in-part of Ser. No. 862,361, Sept. 30, 1969, abandoned. This application Nov. 10, 1971, Ser. No. 197,263

Claims priority, application Germany, Oct. 19, 1968, P 18 04 041.0

Int. Cl. G11b *25/02, 3/00*

U.S. Cl. 274—22 **4 Claims**



A sound reproducing device for toys and the like comprising a drum as a carrier for the sound grooves, the drum being reciprocably journaled. The sound grooves extend helically over the drum circumference. The groove system consists of two interposed tracks connected at their terminations by means of guidings for the stylus of the pickup means, enabling the stylus to permanently engage any one of the grooves and thus eliminating the necessity to disengage the stylus for return to the respective groove start point of a groove.

3,722,892

TAPE RECORDER WITH CASSETTE CHANGER

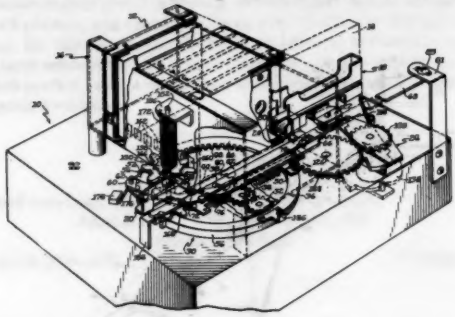
Robert Haake, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 29, 1970, Ser. No. 50,601The portion of the term of this patent subsequent to Sept. 7, 1988, has been disclaimed.

Int. Cl. G11b *15/24, 23/12*

U.S. Cl. 274—4 F **17 Claims**

A tape recorder-reproducer having a mechanism for loading any one of a plurality of cassettes from a magazine into a carrier means, for rotating the carrier means to invert the cassette to position each of two magnetic tracks on a tape in an effective position for recording or reproduction, for unloading



the cassette from the carrier means into the magazine and for advancing the magazine to permit repeating the cycle.

3,722,893

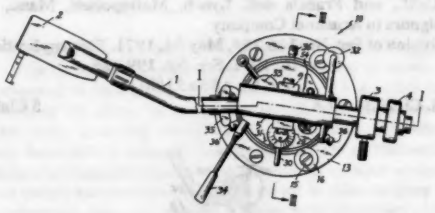
PICKUP OF DISK REPRODUCER

Seisuke Shimoda, and Yoshiaki Shimoda, both of Tokyo, Japan, assignors to Toho Machine Co., Ltd., Tokyo, Japan

Filed April 17, 1970, Ser. No. 29,493

Int. Cl. G11b *3/10*

U.S. Cl. 274—23 R **4 Claims**



A pickup for disk transducing mechanisms is disclosed including a stylus force applying means for varying the contact force between the stylus and the recording disk. Another feature of the invention resides in the provision of a mechanism to rotate the pickup arm in opposition to the force produced by the stylus tracking in the spiral groove of the recording disk. Another feature of the invention is the provision of means for simultaneously adjusting the contact force and the tendency of the pickup arm to rotate toward the axis of rotation of the disk.

3,722,894

SEALING GLAND WITH UNSTRESSED STANDBY SEAL

Alan Cameron-Johnson, St. Albans, England, assignor to Hawker Siddeley Aviation Limited, Kingston-upon-Thames, Surrey, England

Filed March 3, 1971, Ser. No. 120,460

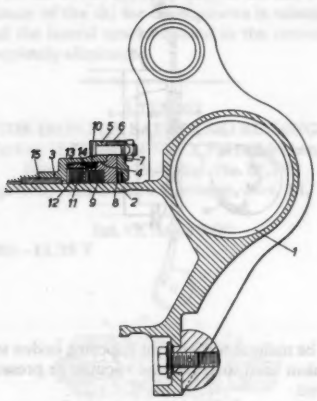
Claims priority, application Great Britain, March 6, 1970, 10,888/70

Int. Cl. F16j *9/00*

U.S. Cl. 277—9 **8 Claims**

A sealing gland assembly for an aircraft undercarriage leg in which, in addition to the primary or working seal ring, a standby seal ring is stored in an unstressed condition on the 'wet' side of the working seal ring. Both seal rings are contained within a seal chamber formed by an enlargement at the end of

the outer tube of a sliding telescopic pair of tubes, the open end of the enlargement being substantially closed by a gland



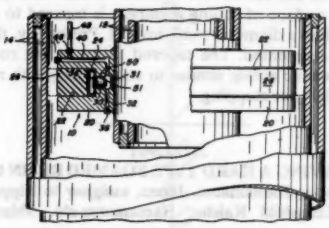
ring that has an axial flange extending into the seal chamber and compressing the working seal, but not the standby seal, against the inner tube.

3,722,895

SEALING DEVICE

Ernst A. Mevissen, Robinson Township, Allegheny City., Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1970, Ser. No. 102,831
Int. Cl. F16j *15/46*
U.S. Cl. 277—34.3 13 Claims



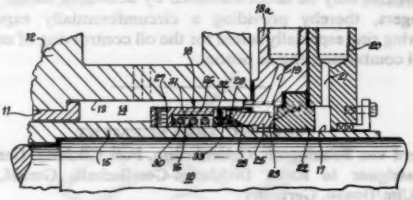
A device for providing a sealed contact between two metal telescoping members is disclosed. One of the members has an annular packing-receiving channel secured thereon. An expansible tubular annulus forming part of the sealing device is entirely contained in the channel. Fluid pressure means is provided for selectively supplying fluid under pressure to the annulus and for relieving the fluid pressure therein. A replaceable radially yieldable elastic annular seal member is fitted in the channel around the expansible tubular annulus and has its radial outer peripheral surface projecting from the channel toward the confronting surface of the other member. The outer peripheral surface of the seal member has a sealing surface thereon for contacting the confronting surface of the other member when the tubular annulus is expanded.

3,722,896

SECONDARY SEAL FOR ROTARY MECHANICAL SEAL

Harry Tankus, Wilmette, Ill., assignor to Crane Packing Company, Morton Grove, Ill.

Filed March 19, 1971, Ser. No. 126,030
Int. Cl. F16j *15/34*
U.S. Cl. 277—87 5 Claims



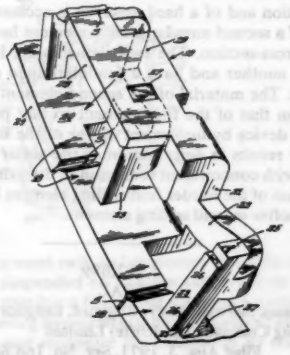
The invention resides in a secondary seal of polytetrafluoroethylene for a rotary mechanical shaft seal. The novel secondary seal replaces and is interchangeable with a known secondary seal also made of polytetrafluoroethylene which has a wedge shape in radial cross section and which causes fretting over the portion of the shaft contacted by the apex of the wedge. The novel secondary seal is somewhat V-shaped or folded in radial cross section and presents the rounded bottom of the fold to the shaft to produce a rolling action of the secondary seal on the shaft instead of the sliding, fretting-producing wedge action of the wedge-shaped secondary seal.

3,722,897

CIRCUMFERENTIALLY EXPANSIBLE OIL RING

Arthur M. Brenneke, New Castle, Ind., assignor to TRW INC., Cleveland, Ohio

Filed June 25, 1970, Ser. No. 49,664
Int. Cl. F16j *9/12*
U.S. Cl. 277—154 8 Claims



A circumferentially expansible oil control channel type piston ring composed of individual linked together circumferential ring portions or units. Each circumferential ring portion or unit has axially spaced top and bottom segments with outer peripheral edges providing scraping surfaces to ride on the cylinder wall. The segments of each unit are connected by an upstanding leg on the inner periphery of the ring. A spring finger extends from the leg of each portion between the segments of the next adjacent portion and terminates in an upstanding strut with ends seated in holes or recesses of the seg-

ments of the adjacent portion to link the portions together. The upstanding struts have shoulders supporting the segments against axial collapse. The ring is continuous and the holes or recesses receiving the ends of the struts are oversized to allow appreciable expansion of the ring so that it may fit over a piston head and snap into the ring groove of the piston. The ends of the struts abut the walls of the recesses or holes before the ring reaches its operating diameter so that further contraction can only be accommodated by deflection of the spring fingers, thereby providing a circumferentially expansible spring ring especially suited for the oil control ring of an internal combustion engine piston.

3,722,898

SEALING ARRANGEMENT

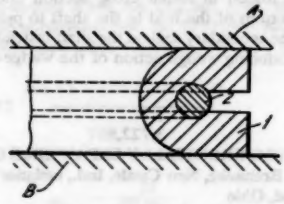
Gerd von Benningsen, Geisenbrunn, Post Gilching, Germany, assignor to Reinz Dichtungs-Gesellschaft, GmbH, Neu-Ulm/Donau, Germany

Division of Ser. No. 830,693, June 5, 1969, abandoned. This application May 11, 1971, Ser. No. 142,257

Claims priority, application Germany, June 6, 1968, P 17 50 805.3

Int. Cl. B65d *53/00*

U.S. Cl. 277—206 **10 Claims**



A sealing arrangement for establishing a seal between two juxtaposed surfaces. A first annular sealing element of solid cross-section and of a hard material is accommodated in the hollow of a second annular sealing element having a channel-shaped cross-section. The two elements are in axial registry with one another and have a predetermined combined axial thickness. The material of the second element is substantially softer than that of the first element so that pressure exerted upon the device by movement of one of the surfaces towards the other results in deformation of the softer second sealing element with concomitant reduction of the axial thickness and penetration of the harder first sealing element into the material of the softer second sealing element.

3,722,899

SEAL

Alfred James Sedwell, Bury, England, assignor to General Engineering Company (Radcliffe) Limited

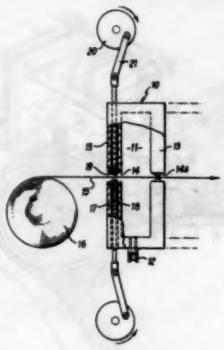
Filed Aug. 3, 1971, Ser. No. 168,609

Claims priority, application Great Britain, Aug. 5, 1970, 37,701/70

Int. Cl. B05c *11/115*

U.S. Cl. 277—237 **9 Claims**

This invention provides a seal for closing an entry or exit aperture of an apparatus in which a moving strip of material is to be treated while in either a partial vacuum or while in a pressurized container, the seal serving completely to close the entry or exit aperture periodically and to deform as the material under treatment moves so that no appreciable drag is imparted to the material and then to open slightly to allow the seal to become undeformed before closing again upon the material so that the increments of time for which the seal is open are small and thus passage of fluid across the seal is minimized thereby to enable the required degree of vacuum or



pressure to be maintained without imposing undue stress upon the mechanism used to create the vacuum or pressure conditions required.

3,722,900

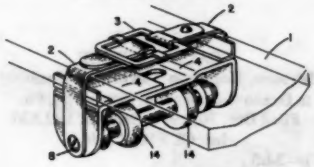
SNOWLESS SKIS

George H. Dickert, 624 Garden Lane, Bristol, Va.

Filed May 1, 1970, Ser. No. 33,749

Int. Cl. A63c *17/18*

U.S. Cl. 280—7.13 **11 Claims**



A ski fitted with a plurality of rollers for use in traversing a smooth solid surface devoid of snow or snow-like substance. The outer surface of rolling members is tapered to a smaller diameter than a diameter more inward. Preferably, the rolling surface is segmented. The tapered shape of the rollers provides a dynamic action similar to snow skiing with respect to turning, edging or stopping.

3,722,901

SKI HAVING A HARD TYPE FOAMED RESIN CORE

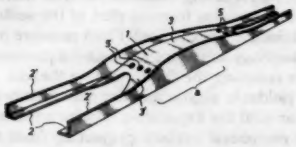
Haruki Kolke, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Feb. 9, 1971, Ser. No. 113,863

Claims priority, application Japan, Feb. 14, 1970, 45/14459

Int. Cl. A63c *5/12*

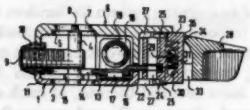
U.S. Cl. 280—11.13 L **8 Claims**



In a ski including a core structure made of a hard type foamed resin, the core structure is further composed of a

screw-holding framework embedded in the hard type plastic foam core body, the framework being beforehand molded to have two longitudinally extending portions for holding screws attaching steel edges of the ski to the body of the ski and a central portion for holding screws attaching a shoe clamping device for the ski to the upper surface of the ski, whereby the holding nature of the ski for these screws is substantially improved and the lateral cracks caused in the conventional ski can be completely eliminated.

3,722,902
TOE IRON FOR SAFETY SKI BINDINGS
Hannes Marker, Hauptstrabe 51-53, Partenkirchen, Germany
Filed Oct. 19, 1970, Ser. No. 81,702
Claims priority, application Germany, Nov. 11, 1969, P 19 56 653.1
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **8 Claims**

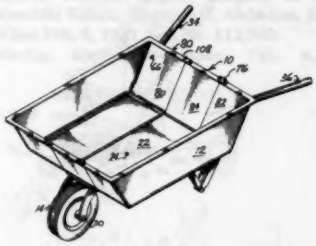


A pivoted member carries a sole holder carrier and is pivotally movable from its normal position against the force of at least one spring about a pivot pin which is at right angles to the surface of the ski. The pivot pin is held on at least one toe iron part which is fixed to the ski. The pivot pin is adjustable relative to the pivoted member in the longitudinal direction of the toe iron.

3,722,903
ADJUSTABLE SKI POLE WITH SPLIT RETAINER RING
John P. Jones, 1326 Shenandoah Drive, Colorado Springs, Colo.
Continuation-in-part of Ser. No. 842,232, July 16, 1969, abandoned. This application Oct. 26, 1970, Ser. No. 90,217
Int. Cl. A63c 11/22
U.S. Cl. 280—11.37 F **2 Claims**

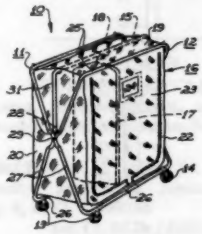
A ski pole which allows one to correctly adjust the overall length of the pole to skier's height. It embodies upper and lower pole sections whose adjacent coacting ends are telescopingly joined and are equipped with manually regulatable coupling means. This coupling means embodies an outer nut-like sleeve having an internal stop shoulder at its lower end and wholly encompassing a longitudinally split inner expansible and contractible sleeve which when clampingly contracted provides a friction held retainer. The lower tapered end of the outer sleeve is cooperatively oriented with a graduated pole length measuring scale provided on the peripheral surface of the lower section of the pole.

3,722,904
FOLDABLE WHEELBARROW
Lloyd S. Puckett, 2127 East Hamlin Street, Seattle, Wash.
Filed Dec. 13, 1971, Ser. No. 207,199
Int. Cl. B62b 1/20
U.S. Cl. 280—36 R **8 Claims**



A wheelbarrow adapted to having its wheel, legs and handles foldable underneath its container center base and its container side sections foldable and enclosing about the folded wheel, legs and handles so that a substantial elongated box shape can be formed for compact safe storage and handling purposes.

3,722,905
COLLAPSIBLE TRANSPORTER FOR GARMENTS AND THE LIKE
Archie Solomon, 900 Edgewater Trail, Atlanta, Ga.
Filed Oct. 26, 1971, Ser. No. 192,513
Int. Cl. B62b 11/00
U.S. Cl. 280—39 **8 Claims**



A portable garment rack and enclosure that rolls on casters with garments suspended on hangers supported on a hanger rod. The apparatus has a frame that supports a protective enclosure for covering the garments during transport and storage and the frame and enclosure are collapsible so that the apparatus takes up a minimum of storage space when not in use.

3,722,906
STROLLER BUMPER
Raymond G. Pierson, Jr., Bedford, and Charles L. Voytko, Johnston, both of Pa., assignors to Hestrom Company, Bedford, Pa.
Filed March 15, 1971, Ser. No. 124,053
Int. Cl. B62b 7/00
U.S. Cl. 280—47.4 **4 Claims**

A collapsible stroller has a seat in which the child sits and a footrest spaced below the seat on which the child may rest his

feet and legs. The footrest projects beyond the front of the carriage and it is adjustable in the usual way between upper and lower horizontal positions. A plastic bumper composed of a shell and strap is clamped onto the front of the footrest and

projects beyond the carriage per se. The shell has a depending skirt and rigidifying ribs which abut the front edge of the footrest so that the bumper as a whole is able to withstand impacts when the footrest is in either of its operative positions.

3,722,907

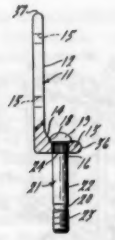
STEERING IDLER ARM BRACKET

John E. Freudenberger, West Unity, Ohio, assignor to Power and Sons, Montpelier, Ohio

Filed June 11, 1971, Ser. No. 152,221

Int. Cl. B62d 7/16

U.S. Cl. 280—95 A **2 Claims**



The idler arm supporting bracket is made from an L-shaped rolled section having a vertical and horizontal flange. A length of the rolled section is cut into narrow strips to form L-shaped supporting elements having a long vertical section and a shorter and thicker horizontal section with a flute of large radius therebetween to provide increased strength between the sections. An aperture in the horizontal section has the flute material cut away thereabout to provide clearance for the head of a pin which is supported in the aperture. The pin has a cylindrical body with a head on one end and a thread on the other end. The pin body has a corrugated section beneath the head which cuts into the wall of the aperture in the horizontal section when the pin is forced thereinto. The bracket and pin form a rigid unit which is attached to the righthand rail member of a vehicle frame for supporting the idler arm of the steering mechanism on the cylindrical body of the pin.

3,722,908

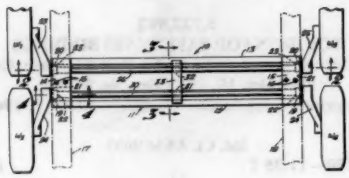
TORSION BAR SUSPENSION SYSTEM FOR TANDEM TRAILER WHEELS

William P. Whitley, Jr., 4525 E. 10th Lane, Hialeah, Fla.

Filed Aug. 24, 1971, Ser. No. 174,365

Int. Cl. B60g 3/12

U.S. Cl. 280—124 B **6 Claims**



A torsion bar suspension system for tandem wheels, suitable for use in boat trailers and the like, is described. An elongated, rectangular, supporting framework carries a pair of transversely-extending, horizontally-spaced torsion bars the outer ends of which have secured thereto, at each side of the supporting framework, downwardly and opposedly outwardly-extending moment arm members the outer ends of which journal the tandem wheel sets. Midway along their lengths, the torsion bars are securely affixed to a wrench bar bridging said torsion bars and adapted to effect reaction therebetween and at the same time provide for substantially independent torsional suspension for each of the supported wheels along its directly associated half torsion bar. End portions of the bridging wrench bar are seatingly supported upon transversely-extending portions of the support framework at a somewhat elevated eccentric position with respect to the ends of said torsion bars to constrain said torsion bars in slightly upwardly curved or bowed disposition for canting the wheels inwardly.

3,722,909

VEHICLE SAFETY BELTS AND HARNESSES AND BUCKLES FOR THEM

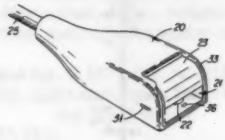
Mark Edward Esner, London, England, assignor to Dynasafe Equipment Limited and Howard Wall Limited, both of London, England

Filed Feb. 12, 1971, Ser. No. 115,030

Claims priority, application Great Britain, Feb. 12, 1970, 6,812/70

Int. Cl. B60r 21/10

U.S. Cl. 280—150 SB **5 Claims**



A safety belt or harness for a vehicle includes a two part buckle of which one part comprises a plate with an aperture and the other part comprises a unit having a bump on which the aperture in the plate fits, one end of the unit consisting of the end of a slidable member which holds the two parts of the buckle together and a mouth where the plate enters the unit. The slidable member is moved by hand to release the plate, and by hand or by the end of the plate when the plate is inserted into the unit. The slidable member slides on a channel housed within the unit, the channel having a hole by which the

unit can be attached to a bracket or cable connected to the vehicle. Adjustment of the belt or harness can be by single or double snubbers carried by the plate or the harness straps or the vehicle fixtures. For adjacent seats or bench type seats two buckles can be mounted on a single fixing bracket which can be such that the buckles can be folded into the seats when not in use.

3,722,910

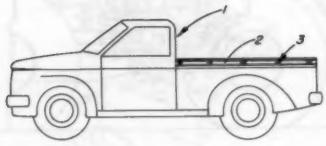
HOOK UNIT FOR PICKUP TRUCKS

Harry R. Heckenlaible, 2086 Webb St., Stockton, Calif.

Filed April 21, 1971, Ser. No. 135,884

Int. Cl. B60p *7/00*

U.S. Cl. 280—179 R **4 Claims**



A rope hook unit removably mounted on a pickup truck or the like; the truck having, in combination with the hook unit, a horizontal, outwardly opening, supporting channel permanently secured thereon, and the hook unit (of which there are several in practice) being wedgingly engaged in the channel for use but manually quick-detachable from said channel for storage when not in use. Additionally, the hook unit is fitted with a manually disengageable locking dog which prevents accidental detachment from the channel of said hook unit when the latter is in use.

3,722,911

TIE DOWN ANCHOR

Howard A. Rhody, 9312 South Forrey, Grand Blanc, Mich.

Filed Oct. 29, 1971, Ser. No. 193,781

Int. Cl. B60p *7/00*

U.S. Cl. 280—179 R **10 Claims**

A tie down anchor mounted on a vehicle and adapted to facilitate the lashing down of a load carried by the vehicle. The tie down anchor has a support plate with spacer means disposed between the support plate and the vehicle to provide a clearance space thereinbetween when the support plate is fastened to the vehicle. The front face of the support plate has a plurality of retaining arms extending outwardly in a spider-like configuration and within which is carried an anchor movable between a first outwardly projecting position and a second lowered position wherein the anchor is disposed behind the retaining arms in a general parallel relationship with the support plate. A channel-shaped cover has legs with inwardly bent end flanges that are adapted to be disposed within the clearance space and slidably engaged to the back side of the support plate when the cover member is slid down over the front face of the support plate. The retaining arms are joined at their extended ends to define a base portion that is spaced from the support plate a sufficient distance to slidably engage the inner face of the cover so as to exert a slight outward force thereagainst and urge the bent end flanges of the cover against the back side of the support plate and thereby secure the cover from accidental removal from the support plate.

3,722,912

FOLDING BICYCLE

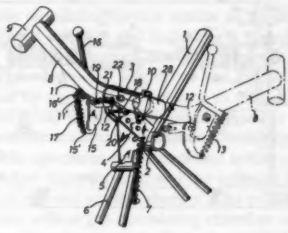
Akira Housayama, Komaki, Japan, assignor to Tsunoda Jitensha Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Filed Feb. 5, 1971, Ser. No. 112,908

Claims priority, application Japan, Feb. 6, 1970, 45/4510784

Int. Cl. B62k *15/00*

U.S. Cl. 280—287 **7 Claims**



Disclosed herein is a folding device for a folding bicycle, according to which a strut is secured on a rear body frame carrying a rear road wheel, a saddle and a crank-pedal thereon and connecting means is mounted on the strut to connect swingably a front body frame carrying a front road wheel to the strut. Provided also to complete the device for simple and easy folding and unfolding works are locking means to have the front body frame fasten to the strut, holding means to maintain the releasing position of the locking means, and a resilient member to hold the fastening position of the locking means.

3,722,913

FOLDING BICYCLE

Akira Housayama, Komaki, Japan, assignor to Tsunoda Jitensha Kabushiki Kaisha, Naka-ku, Nagoya-shi, Aichi-ken, Japan

Filed Feb. 25, 1971, Ser. No. 118,765

Claims priority, application Japan, Feb. 27, 1970, 45/17541; Aug. 8, 1970, 45/69386

Int. Cl. B62k *15/00*

U.S. Cl. 280—287 **9 Claims**

Disclosed herein is a folding device for a folding bicycle which comprises a front body frame carrying a front road wheel, a rear body frame carrying a rear road wheel, an extension member secured on the lower portion of the rear body frame to complete the front body frame, and connecting means to connect transversely and swingably the front body frame with the extension member. Provided also to complete

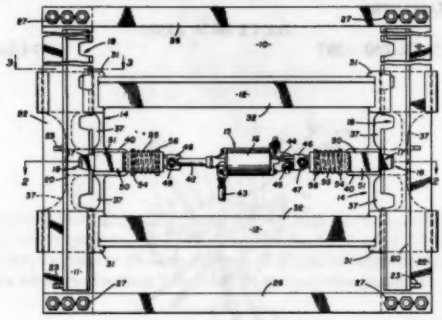
the device for simple and easy folding and unfolding, are locking means to fasten the connecting means, holding means to maintain the released position of the locking means, regulating means to control the holding means, and a resilient member to hold the fastening position of the locking means.

3,722,914

SLIDER MOUNT FOR FIFTH WHEELS

William D. Walther, Dayton, Ohio, assignor to The Dayton Steel Foundry Company, Dayton, Ohio

Filed June 10, 1971, Ser. No. 151,834
Int. Cl. B62d *53/06*
U.S. Cl. 280—407 3 Claims



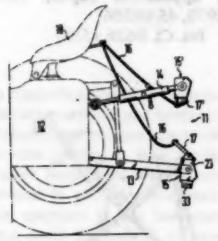
Slider mount to adjust position of fifth wheel coupler assembly with power operated locking mechanism. Coupler mounting trunnions are carried medially of transverse double span slides moving on parallel composite rail members. Locking mechanism carried on the support member beneath the trunnions includes reciprocating plungers having angulated locking faces selectively engaging correspondingly shaped notches formed integrally in the rail members.

3,722,915

HITCH FOR COUPLING AGRICULTURAL IMPLEMENTS TO A TOWING VEHICLE

Josef Gail, No. 1, 8891 Unterwittelsbach, Germany

Filed Oct. 18, 1971, Ser. No. 190,119
Claims priority, application Germany, Oct. 26, 1970, P 20 52 389.1; July 6, 1971, P 21 33 516.0
Int. Cl. B60d *1/04*
U.S. Cl. 280—415 A 12 Claims



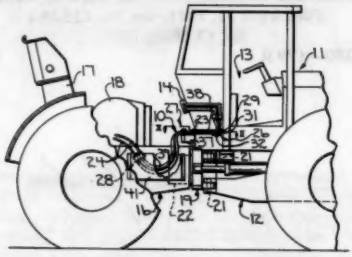
An agricultural implement is coupled to a tractor by one upper and two lower releasable links, each lower link having a male coupling member at the end of a linking bar attached to the tractor and an eye on the implement adapted conformingly to receive the coupling member which has the general shape of an upwardly tapering frustum of a pyramid and is provided with a latch biased toward a position in which it holds the coupling member and eye in the conformingly engaged position. The upper link is an inverted version of one of the lower links.

3,722,916

MOUNTING ARRANGEMENT FOR FLEXIBLE MEMBERS

John R. Muntjanoff, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 10, 1971, Ser. No. 206,661
Int. Cl. B60d *1/08*
U.S. Cl. 280—421 13 Claims



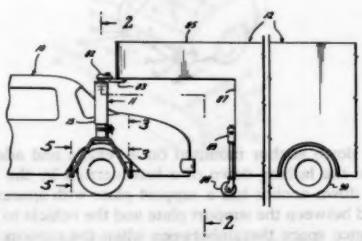
An improved mounting arrangement for flexible members such as flexible hoses which extent between the front and rear sections of an articulated vehicle which has a center hitch member to permit limited relative swinging movement of the sections in a horizontal plane about a vertical axis and to permit limited relative rotation about a horizontal axis in a vertical plane. The arrangement includes a first clamp which attaches the hoses to the front section and a second clamp which attaches the hoses to the hitch member in a manner which provides sufficient slack in the hoses to form a collapsible loop between the front section and the hitch member which loop resides in a plane substantially normal to the vertical axis. A third clamp attaches the hoses to the rear section of the vehicle so as to form a travelling loop between the hitch member and the rear section which resides in a plane substantially normal to the horizontal axis of the hitch.

3,722,917

TRAILER HITCH APPARATUS

Paris A. Mims, and Larry Ronnie Nettles, both of 5931 Britmore Rd., Houston, Tex.

Filed June 28, 1971, Ser. No. 157,497
Int. Cl. B62d *53/00*
U.S. Cl. 280—423 R 5 Claims



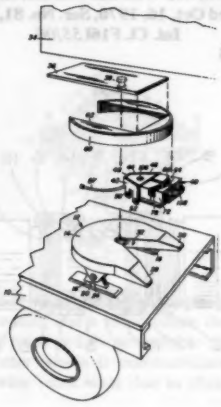
Trailer hitch apparatus wherein a support beam is mounted over the rearward portion of a vehicle, e.g. an automobile, and the trailer, extending over the rearward part of the vehicle, is connected by a trailer hitch to the support beam. Each end of the support beam is provided with a hinged yoke, the ends of each yoke each being removably connected to a fitting installed on the vehicle, and the fittings being preferably disposed forward and rearward of each rear wheel of the vehicle.

3,722,918

ANTI-JACKNIFING DEVICE FOR TRACTOR-TRAILER TRUCKS

Elmer W. Conner, 207 East Fremont, Medicine Lodge, Kans.

Filed June 23, 1971, Ser. No. 155,911
U.S. Cl. 280—432 14 Claims



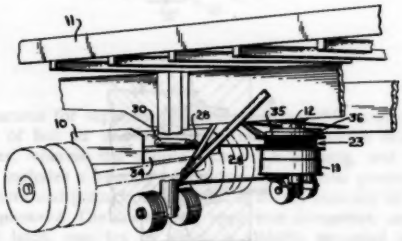
An anti-jacknifing device for tractor-trailer trucks which includes braking means mounted on the fifth wheel of the tractor and a vertical arcuate skirt mounted on the under surface of the trailer, concentrically with the kingpin. The braking means define an arcuate gap having the same radius as the skirt and which partially surrounds the vertical skirt, and brake pads arranged on both sides of the gap can simultaneously engage the vertical skirt to effectively prevent a jacknifing movement of the trailer.

3,722,919

ANTI-JACKKNIFE DEVICE

Francis A. Herbert, P.O. Box 81, Schriever, La.

Filed Dec. 7, 1971, Ser. No. 205,519
Int. Cl. B60d 7/00
U.S. Cl. 280—432 8 Claims



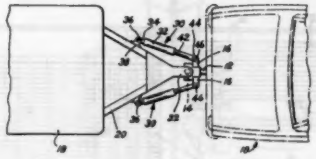
The present invention is directed to a braking device separate from the wheel brakes of the vehicle which may be mounted either on the tractor or the trailer and which is subjected to the actuating fluid when the vehicle wheel brakes are applied and which locks with a cable drum and cable when the free end of the cable is connected to the unit of the tractor - trailer that a brake device is not connected to which will arrest the horizontal swing of the trailer relative to the tractor before attaining the point of no return at which jackknife results.

3,722,920

HYDRAULIC STABILIZING DEVICE

Terrell J. Reese, Elkhart, Ind., assignor to Reese Products, Inc., Elkhart, Ind.

Division of Ser. No. 861,972, Sept. 29, 1969, abandoned. This application Feb. 12, 1971, Ser. No. 115,039
Int. Cl. B62d 53/00
U.S. Cl. 280—446 B 5 Claims



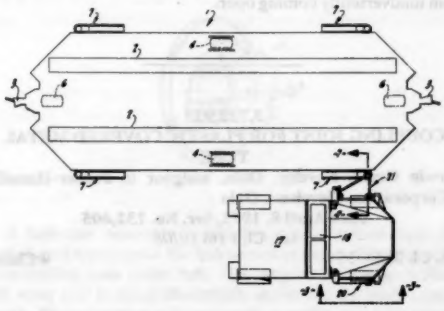
A hydraulic stabilizing device usable as a sway control for trailers or towed vehicles and including a hydraulic cylinder-piston unit having a normal position wherein the piston is located intermediate the length of the cylinder and being characterized by negligible resistance to piston movement in one direction from normal position and greater resistance to piston movement in the other direction from normal position. The piston has apertures and associated spring closures regulating liquid flow therethrough and the cylinder has piston bypass means at one end portion thereof. The cylinder contains a sealed flexible hollow gas-containing chamber adapted to expand and contract to maintain the volume of the liquid-containing portion of the cylinder substantially constant during elongation and shortening of the unit.

3,722,921

TRACTOR-TRAILER SIDE TOW CONSTRUCTION

Arnold Duerksen, Salinas, Calif., assignor to Cochran Western Corp., Salinas, Calif.

Filed March 24, 1971, Ser. No. 127,574
Int. Cl. B60d 1/04
U.S. Cl. 280—473 27 Claims



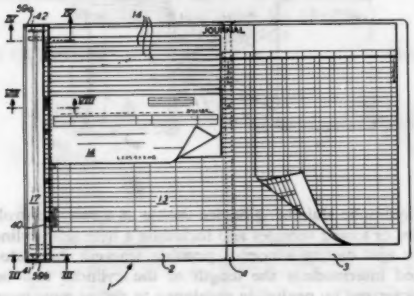
A towing tractor and towed trailer combination including structure at each of the sides of the trailer which impart side tow capability thereto. The trailer towing structure includes an inclined ramp and communicating socket at each corner of the trailer with which a towing pin of the tractor towing mechanism is removably engageable. The tractor towing mechanism includes hydraulic means at each side of the tractor and associated control mechanism for selectively positioning a tractor towing pin in operative engagement with a trailer ramp and socket structure so that rapid insertion or removal of the towing pin relative to a preselected trailer socket may be effected.

3,722,922

POSTER BOARD FOR ACCOUNTING FORMS

Guillermo Perez, Bloomfield, N.J., assignor to Litton Business Systems, Inc., Carlstadt, N.J.

Filed March 10, 1970, Ser. No. 18,038
Int. Cl. B41l 3/04, 3/06
U.S. Cl. 282—29 B 2 Claims



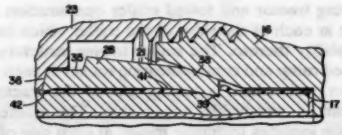
A folding poster board on which accounting forms are mounted, including a clamping means for clamping the forms to the board and a stripper plate for stripping forms from the board. A separate operating plate is provided for operating the stripper plate. The clamping member is mounted for rotation about a first axis, and the stripping plate and operating plate are mounted for rotation about a second axis parallel to and spaced from the first axis. Toggle spring means holds the clamping member resiliently in its open and closed positions. The operating plate for the stripper plate is resiliently biased away from the latter towards a relative position where further movement of the operating member will operate the stripper member. The board comprises first and second board members hinged together. When the second board member is folded over to cover the first board member, the clamping member, when moved to closed position, will engage the second board member and thereby prevent the poster board from inadvertently coming open.

3,722,923

COUPLING JOINT FOR PLASTIC COVERED METAL TUBE

Darwin Grahl, Novelty, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed April 8, 1971, Ser. No. 132,405
Int. Cl. F16l 19/08
U.S. Cl. 285—55 4 Claims



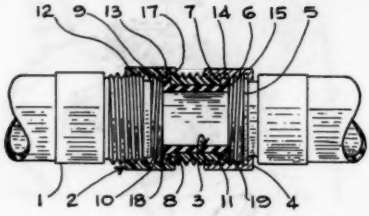
A tube coupling joint comprising a metallic tube with a non-metallic sheath, the tube coupling including a sleeve deformed into gripping engagement with the metallic tube and into sealing engagement with the non-metallic sheath.

3,722,924

COMBINED COUPLING AND SEALING ADAPTER

Melvin G. Bjornsen, 805 West San Marino, Alhambra, Calif.

Filed Oct. 16, 1970, Ser. No. 81,239
Int. Cl. F16l 55/00
U.S. Cl. 285—55 1 Claim



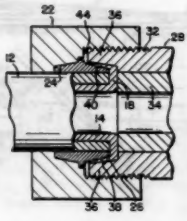
A combined coupling and sealing adapter for joining threaded male and female base coupling members, particularly damaged coupling members. The adapter has a compliant tubular body with threaded male and female ends for threaded connection to the female and male base coupling members, respectively, and a terminally flanged resilient sealing sleeve captivated within the adapter body for sealing contact with the coupling members.

3,722,925

COUPLING AND/OR JOINING LINED PIPE

James F. Robbins, Westford, Mass., assignor to Sybron Corporation, Rochester, N.Y.

Filed March 25, 1971, Ser. No. 128,108
Int. Cl. F16l 9/14, 19/04
U.S. Cl. 285—55 4 Claims



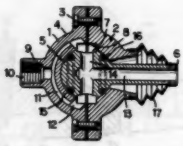
Disclosed is a coupling and a method for joining tin lined tubings wherein a portion of the tubing is removed to expose a portion of the tin lining. The exposed lining is then flared over the end of the tubing so that during connection of the tubing to a fitting by conventional ferrule and nut means, the flared tin is forced against and over the ferrule to form a joint completely lined with tin including a layer of tin between the opposed pipe and fitting faces.

3,722,926

LIQUID COUPLING

Rinjiro Fukushima, No. 1-090, Toyoda, Hino-shi, Tokyo, Japan

Filed July 12, 1971, Ser. No. 161,491
Claims priority, application Japan, July 13, 1970, 45/61259
Int. Cl. F16l 27/06
U.S. Cl. 285—261 2 Claims



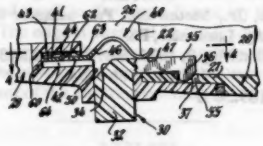
The disclosure relates to a liquid coupling for connecting a path between a casing and a rotor within the casing, the path being around the rotor and then normal to the axis of the rotor to the rotor center where it communicates with an outlet passage to decrease rotor wear due to abrasion thereof with the casing.

3,722,927

LATCH AND RETURN SPRING

Aivars Miska, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 20, 1971, Ser. No. 145,211
Int. Cl. F16l 21/08
U.S. Cl. 285—317 8 Claims



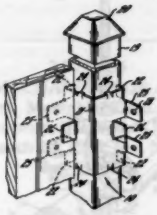
Apparatus for separably connecting a portable source of supply of hot air and a hair grooming implement holder together, wherein the source includes a housing, and the holder includes a housing adapted to carry a hair grooming implement and guide hot air from the source laterally of the the implement. The connecting apparatus comprises: an L-shaped latch, one leg of which is slidably mounted in a passageway formed in one of the housings, and the other leg of which is positioned to internally overlap a portion of the other housing when the housings are brought together for connection; a leaf spring connected to the one housing to contact the latch for resiliently loading the latch in the passageway; and a keeper cavity formed in the other housing for receiving the other latch leg. The spring resiliently loads the latch for forcing the other latch leg into the cavity to connect the housings together, and the latch is manually movable against the spring load to enable the housings to be separated. Also, the spring acts as a stop to limit the travel of the latch so as to prevent the spring from being overstressed.

3,722,928

PANEL RETAINER FOR PORTABLE TIERING RACK

Leroy F. Skubic, La Porte, Ind., assignor to The Paltier Corporation, Michigan City, Ind.

Filed May 7, 1971, Ser. No. 141,109
Int. Cl. F16b 5/06
U.S. Cl. 287—20.924 5 Claims



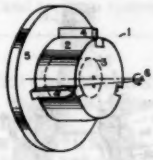
A one-piece panel retainer is provided for attaching side panels to a portable tiering pallet rack having a base frame and a plurality of vertical corner posts. Each retainer is formed with a body which nests against the inner peripheral surfaces of a post, mounting clips which hold it against the post, tangs which preclude sliding along the surfaces of the post, and cleats which position and engage the side panels approximately tangent to the outer peripheral surfaces of the post. In a typical installation, at least two such retainers may be mounted on each post. One retainer per post may be used for low panels or for racks with panel securing devices built into the pallet base frame.

3,722,929

HUB-CORE ASSEMBLY

Samuel Gilman, West Los Angeles, Calif., assignor to Terminal Data Corporation, Van Nuys, Calif.

Filed Jan. 20, 1971, Ser. No. 107,914
Int. Cl. F16d 1/06
U.S. Cl. 287—53 SS 3 Claims



A hub-core assembly in which nominal deformation of a radial projection upon the hub serves to removably secure the surrounding core to the hub. The projection engages a slot in the core and is circumferentially deformed by such engagement. The projection is formed with a small angle with respect to the axis of rotation of the hub. The projection may have a central open slit to facilitate resilient deformation focushioning the assembly during rapid starts and stops.

3,722,930

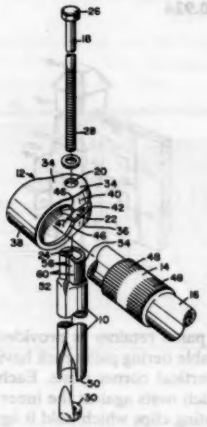
BICYCLE HANDLEBAR STEM

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Incorporated, Maysville, Ky.

Filed Sept. 3, 1971, Ser. No. 177,650
Int. Cl. F16b 7/18
U.S. Cl. 287—54 E 10 Claims

The handlebar stem, constructed inexpensively of formed sheet metal parts, requires but a single bolt for simultaneously

clamping the handlebar ferrule, fixing the stem head upon the stem, expanding the stem within the fork bearing tube, and effecting at the same time powerful friction bites between the



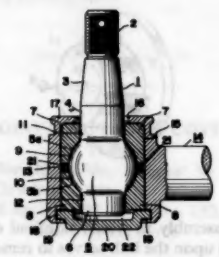
head, the stem, and said ferrule, to fix said parts securely against relative displacement incident to tightening the stem bolt.

3,722,931

SWIVEL JOINT

Yasuo Uchida, Hamamatsu, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1971, Ser. No. 192,068
Claims priority, application Japan, Nov. 5, 1970, 45/97415
Int. Cl. F16b *17/00*
U.S. Cl. 287—93 **2 Claims**



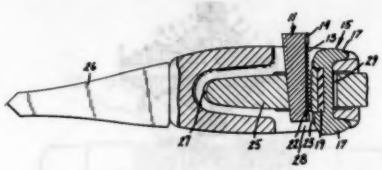
A swivel joint comprising a stud having an upper cylindrical stem portion, a lower cylindrical stem portion and a substantially spherical member disposed between said upper and lower cylindrical stem portions, an annular upper bearing member and an annular lower bearing member, and a socket receiving therein and supporting said upper and lower bearing members. Said annular upper bearing member and an annular lower bearing member receive therein and support an upper half of said substantially spherical member and said upper cylindrical stem portion contiguous therewith and a lower half of said substantially cylindrical member and said lower cylindrical stem portion contiguous therewith respectively to act as a bearing.

3,722,932

CONNECTING APPARATUS FOR TOOTH ADAPTER ASSEMBLY

James R. Dougall, New Brighton, Minn., assignor to Minneapolis Electric Steel Castings Company, Minneapolis, Minn.

Filed Nov. 10, 1971, Ser. No. 197,243
Int. Cl. F16b *7/00*
U.S. Cl. 287—103 D **7 Claims**



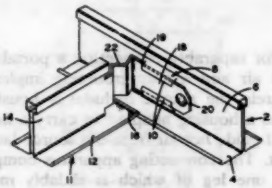
Apparatus for removably connecting a digger tooth adapter to an excavating shovel. The adapter and lip of the shovel fit together in overriding relation, with openings in each aligning to form a passage which receives a C-shaped clamp and wedge. The back side of the C-clamp has a rectangular recess which receives a locking member. The locking member has an exposed face which is serrated, and it is urged out of the recess by a resilient mounting pad. The wedge also has a serrated face which mateably engages the locking member. To simplify removal of the adapter from the shovel, a longitudinal groove is formed in the engaging face of the wedge which extends through and below the serrations. A partial groove is formed in the C-clamp, and the grooves together guidably receive a spike therebetween which, upon insertion, separates the respective serrated faces and enables the wedge to be removed.

3,722,933

EXPANSION JOINT FOR A FIRE-RATED CEILING SYSTEM

Ernest B. Nute, Jr., Mountville, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 7, 1971, Ser. No. 141,243
Int. Cl. F16b *7/04*
U.S. Cl. 287—189.36 A **5 Claims**

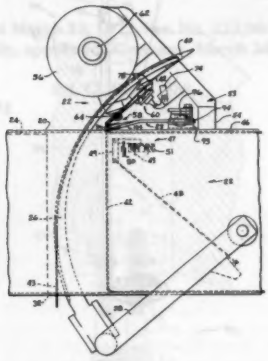


The cross member of a ceiling system is connected to the main runner of a ceiling system by a slide lock tab. A tab is bent at a 90° angle to the longitudinal axis of the cross runner. This tab slides into a fastener on the main runner structure. The connecting element between the cross member proper and the tab is corrugated so that, during a fire condition, the cross member can expand without buckling. Expansion occurs due to the collapse of the corrugated structure.

3,722,934
TWINE FINGER FOR KNOTTER MECHANISM OF A BALER

Edwin B. Nolt, New Holland, and Irwin D. McIlwain, Lancaster, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed July 1, 1971, Ser. No. 158,746
Int. Cl. B65h *69/04*
U.S. Cl. 289—13 10 Claims

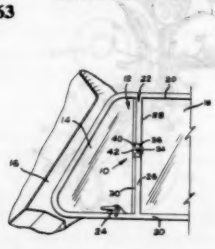


A pivotally mounted twine finger has a hook portion and lateral extension at the forward end under the knotter unit of a baler and an opening between the extension and hook portion. A latch is pivotally mounted on the lateral extension and has a projection extending across the entrance of the opening. The projection is held in a closed position by a resilient bias on the entrance side of the pivotal connection and in a non-contacting, overlapping relation with the hook portion by an anvil on the other side. The latch prevents the leading and trailing strands of twine from escaping from the opening through the entrance as the twine finger holds the strands taut against the bill hook during the twisting operation, the pulling of the twisted strands along the bill hook to form the knot and the assisting in pulling the knot from the bill hook. A forwardly facing straight edge on the latch generally spans the pivotal connection and anvil to distribute forces on the latch to the twine finger. The edge is engaged by the leading strand during baling and guides the leading and trailing strands into the opening on the pivotal movement of the twine finger on the commencement of the knotting operation.

3,722,935
LOCKING DEVICES FOR VEHICLE VENT WINDOWS

Ismail Osman Latib, 383 Kerk Street, Transvaal, Republic of South Africa

Filed March 24, 1971, Ser. No. 127,637
Claims priority, application Republic of South Africa, April 2, 1970, 2201
Int. Cl. E05c *19/18*
U.S. Cl. 292—63 4 Claims

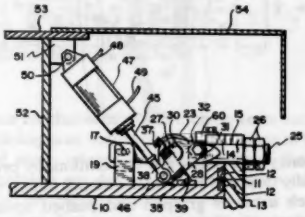


A vehicle vent window locking device adapted to be fitted to a vent window of a vehicle which has a window bar separating the vent window from an adjacent side window of the vehicle and which window bar has a side face directed towards the side window and a side window groove in the side face for the side window, the locking device including bolt means having a lip portion extending from its free end, the lip portion being adapted to be received in the side window groove and imprisoned therein by the side window. A vehicle vent window locking device adapted to be removably fitted to a vehicle vent window, and including bolt means to lock the vent window.

3,722,936
LATCHING MECHANISM FOR ACCESS DOOR

John Wesley Stubert, Memphis, Tenn., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed March 24, 1971, Ser. No. 127,231
Int. Cl. E05c
U.S. Cl. 292—64 29 Claims

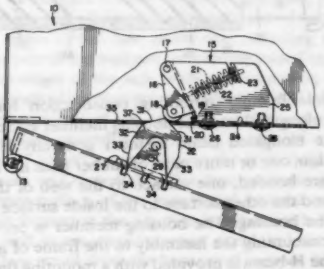


An enclosed structure having an opening for access thereto with an acesss door, which can close the opening, mounted movably to the structure, and a latch mechanism for securing the door in closed position over the opening in the structure. The latch mechanism comprises a locking bolt pivotally mounted to a supporting bracket on the structure to be swung into and out of engagement with a pair of mating troughs in the edge of the door and opening. A pivot shaft extends laterally from the side of the bolt between the bolt ends and a cam is mounted on the pivot shaft to rotate relative to the bolt. A lever arm is joined to the cam to rotate the cam. The cam has a face which contacts the opening edge, restrains forward movement of the bolt and applies a rearward force thereon.

3,722,937
SPRING LEVER CATCH AND STRIKE CAM

Ernest P. Stoeckl, St. Charles, Ill., assignor to Geneva Industries, Inc., Geneva, Ill.

Filed June 30, 1971, Ser. No. 158,278
Int. Cl. F05c *19/02*
U.S. Cl. 292—79 6 Claims



A spring actuated lever which functions as a catch for a door and as a buffer or cushion for closing movements of the

door in cooperation with a strike which is contoured to provide the cushioning action upon initial contact with the spring actuated lever, then provides a camming action to pull the door fully closed whereupon the strike by reason of its shape acts as a catch in association with the spring actuated lever to retain the door in closed position.

3,722,938

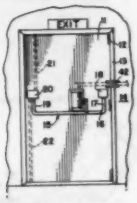
EMERGENCY EXIT DOOR UNLATCHING ACTUATOR

Charles A. Bauer, Woodbridge, and Alfred E. Floyd, North Guilford, both of Conn., assignors to Sargent and Company, New Haven, Conn.

Filed March 22, 1971, Ser. No. 126,455

Int. Cl. E05c *21/00*

U.S. Cl. 292—92 **7 Claims**



Emergency exit doors are conventionally provided with a horizontally disposed bar which extends across the inside of a door. Such a bar is grasped and pushed towards the door which action unlatches the door and constitutes a means for opening the door as such emergency doors are hinged to move outwardly. The unlatching actuator is used to move the said bar downwardly towards the surface of the door by electric motive means without the necessity of using manually applied force. The bar is then held in an unlatched condition until the same electric motive means is utilized to permit the return of the bar to a normal position which is accomplished by the usually employed spring means associated with emergency or panic exit door unlatching assemblies.

3,722,939

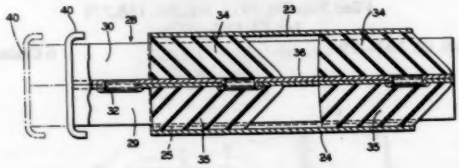
VEHICLE BUMPER MOUNT CONSTRUCTION

Herman S. Church, Cuyahoga Falls, and James L. Hagener, Canton, both of Ohio, assignors to Teledyne Mid-America Corporation, Hartville, Ohio

Filed Nov. 23, 1971, Ser. No. 201,335

Int. Cl. B60r *19/06*

U.S. Cl. 293—88 **15 Claims**



A vehicle bumper mounting construction formed of a generally elongated box-like housing member enclosing a portion of an elongated beam member generally H-shaped in cross section, one or more pairs of rubber pads having parallel surfaces are bonded, one surface to the web of the H-beam member and the other surface to the inside surface of the side walls of the housing. The housing member is provided with means for mounting the assembly to the frame of an automobile and the H-beam is provided with a mounting flange for attaching an automobile bumper to the assembly. Impact energy applied to the bumper is absorbed by the construction by deflection of the H-beam placing shear stress on the pairs of rubber pads.

3,722,940

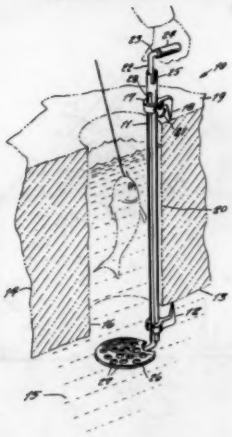
ICE FISH SAVER

Sandra M. Misjak, 1410 Calhoun Street, Peru, Ill.

Filed Aug. 25, 1971, Ser. No. 174,850

Int. Cl. A01k *69/00*

U.S. Cl. 294—1 R **1 Claim**



An accessory for ice fishing and which serves to close a lower end of a hole through the ice when a fish is being pulled up therethrough so to prevent the fish to escape in case it meantime gets off the hook; the device consists of a stationary tube attachable along a side of the hole in the ice, the tube supporting a rod having a handle at its upper end and a horizontal gate plate at its lower end, the rod being pivotable by the handle so as to swing the gate into a closed position at the bottom end of the hole, and the plate then being movable upwardly so to bring the fish into the top end of the hole in the ice.

3,722,941

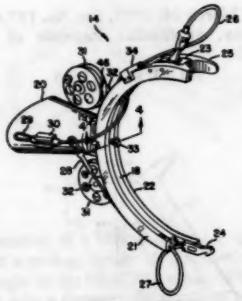
MARINE MAMMAL UNDERWATER ATTACHMENT AND RECOVERY TOOL

Ronald L. Seiple, Kailua; Edward A. Ashenden, P. O. Box 990, Honolulu, Hawaii, and Robert L. Webb, Kailua, all of Hawaii, assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 3, 1972, Ser. No. 223,162

Int. Cl. B66c *1/18*

U.S. Cl. 294—66 R **10 Claims**



An attachment and recovery tool for recovery of underwater objects has two telescopically extending arms which together with a central portion encircles the object to be

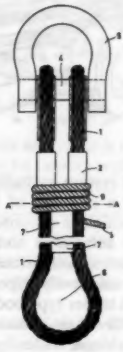
recovered. The telescopically extending arms are urged into object engaging position by spring motor means mounted on the central portion. Latch units mounted on each telescopic arm secure them in encircling engagement with the object to be recovered. Cable means carried by said latch means cooperate with a lifting line to raise the object to the surface.

3,722,942

LOAD BEARING STRAP

Hans Baur, von der Osten Strasse 6, D-8902 Goggingen, Germany

Filed March 13, 1972, Ser. No. 233,984
Claims priority, application Germany, March 24, 1971, P 21 14 207.4
Int. Cl. B66c 1/18
U.S. Cl. 294—74 **10 Claims**



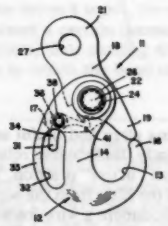
A load bearing strap comprising a multiple strand cable having a pair of eye loops formed at its ends coupled to a shackle. An open loop is disposed at the other end of the strap and is formed by bending the cable and coupling its ends to the shackle. A resilient spacing member, having semi-cylindrical recesses in its sides, is disposed between the sections of the cable between the open loop and the pair of eye loops for supporting the sections of the cable. A multiple strand rope or cable is wound tightly around the cable and the spacing member to form a protective jacket on the cable and increase its rigidity.

3,722,943

SAFETY HOOK

John Kalua, Jr., 865 White Cottage Road, Angwin, Calif.

Filed May 12, 1971, Ser. No. 142,548
Int. Cl. B66c 1/36
U.S. Cl. 294—82 R **2 Claims**



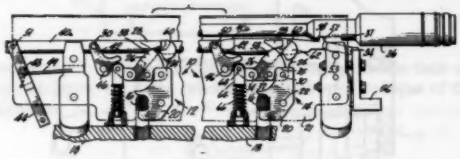
A hook for use with crane blocks, lifting hoists, and the like, having a safety keeper for closing and locking the hook to prevent inadvertent release of a load. The hook is characterized by a pistol grip and trigger release mechanism included in the shank portion of the hook to facilitate convenient unlocking of the keeper and release of the load without requiring the operator to place his hands in the vicinity of the load bearing portion of the hook.

3,722,944

STORE RELEASE MECHANISMS

Harvey Stewart Dand, Garden Grove, Calif., assignor to McDonnell Douglas Corporation

Filed April 2, 1971, Ser. No. 130,589
Int. Cl. B66c 1/34
U.S. Cl. 294—83 R **12 Claims**



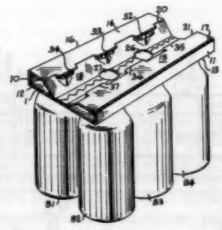
Store release mechanisms which include sears and pawls in their release linkages as well as overcenter means in both store engaging and store release positions thereof. Pairs of the present mechanisms are designed to cooperate so that either mechanism can be independently moved into the store engaging position, yet positive means are provided to prevent one or more mechanisms from being in an inadvertent unlocked or unsafe store engaging position.

3,722,945

CARRIER FOR FLANGED ARTICLES

Prentice J. Wood, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Nov. 15, 1971, Ser. No. 198,699
Int. Cl. B65d 71/00
U.S. Cl. 294—87.2 **5 Claims**



A carrier for flanged articles includes a generally rectangular base panel, a pair of side walls foldably joined respectively to the side edges of the base panel and extending upwardly therefrom, a pair of top wall panels foldably joined respectively to the top edges of the side walls and extending inwardly therefrom, a pair of support panels foldably joined respectively to the inner edges of the top wall panels and extending downwardly and inwardly therefrom, a pair of anchoring panels foldably joined respectively to the inner edges of said support panels and disposed in flat face contacting relation with the upper surface of the base panel, at least one flange receiving slit formed at the junction between each of the top wall panels and its associated support panel, at least a pair of stabilizing flaps struck from the base panel in areas thereof adjacent the side walls respectively and each flap being folded upwardly to occupy a position adjacent its associated side wall and defining an article receiving aperture in the base panel, and a flange receiving slit formed in each stabilizing flap and

arranged to cooperate with the corresponding flange receiving slit in the associated top wall panel and support panel for engaging diametrically opposite sides of an article underneath the flange thereof.

3,722,946

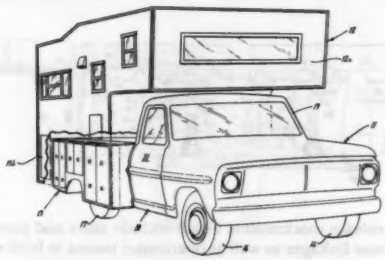
CAMPER AND CABINET CONSTRUCTION THEREFOR

Thomas Francis Cary, 546 Emory St., San Jose, Calif.

Filed Nov. 30, 1970, Ser. No. 93,622

Int. Cl. B60p *3/32*

U.S. Cl. 296—23 MC **11 Claims**



A camper having a pickup with a camper body mounted on the pickup and with a cabinet construction provided on each side of the pickup and underlying overhanging portions of the camper body.

3,722,947

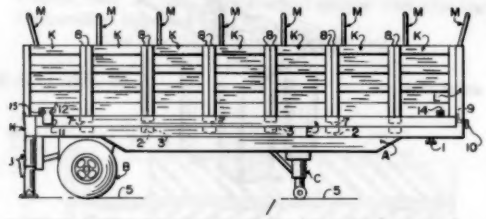
RETRACTABLE SIDE FRAME FOR FLAT BED TRAILER

Mark L. Zucca, 1608 Lafayette St., Alameda, Calif.

Filed Nov. 29, 1971, Ser. No. 202,959

Int. Cl. B62d *33/08*

U.S. Cl. 296—26 **5 Claims**



A retractable side frame for flat bed trailer in which a U-shaped frame has side members that are slidably received in channels which in turn are removably mounted adjacent to the sides of the flat bed. The U-shaped frame has telescopic legs which may be extended to contact the ground when it is desired to retract the side U-shaped side frame and thus expose the flat bed so that items can be loaded onto or removed from the flat bed along the sides thereof. A modified form of the device discloses mechanical means for retracting the side frame and another modified form shows that the U-shaped retractable side frame as well as the two channels that receive the side members of the rectractable frame can be formed in sections so that the device can be readily disassembled and stored when it is desired to use the flat bed trailer without the retractable side frame.

3,722,948

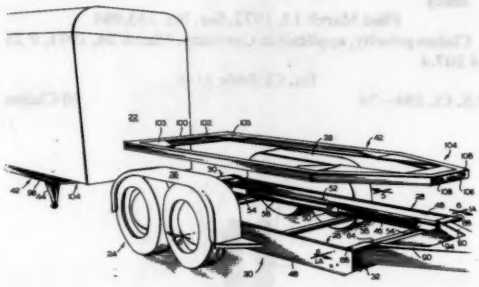
MULTI-TRANSPORT SYSTEM

David P. Walsh, and Joanne M. Walsh, both of 1400 Ramsey Drive, Edgewater, Md.

Continuation-in-part of Ser. No. 873,001, Oct. 31, 1969. This application Nov. 18, 1970, Ser. No. 90,667

Int. Cl. B60p *3/42*

U.S. Cl. 296—35 A **10 Claims**



A multi-use transport system including a trailer having a main chassis frame and a plurality of interchangeable type trailer bodies each of which is mounted on a substantially identical sub-frame, the sub-frame and main chassis frame being so interrelated and designed for coacting cooperative interengagement of each said body type sub-frame with the main chassis frame. Each trailer type body is mountable selectively on an identical trailer main chassis, permitting variable multiple function use of a single trailer.

3,722,949

WINDSCREEN FILTERS

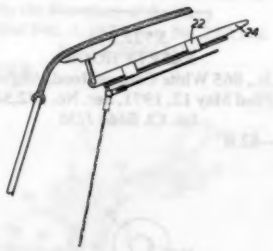
Leonard Palman, 5 Windsor Close, Hendon Lane, London, England

Filed April 14, 1971, Ser. No. 133,994

Claims priority, application Great Britain, April 20, 1970, 18,735/70

Int. Cl. B60j *3/02*

U.S. Cl. 296—97 C **2 Claims**



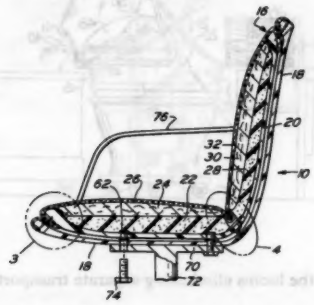
A filter for reducing glare and useful as a windscreen filter for vehicles is angularly displaceable relative to a support by means of a hinge to an "in use" position. The hinge is resilient to permit removal of the filter from the support.

In a preferred embodiment a wire frame is clipped on to the sum blind of, for example, a car, and has end portions which by virtue of the shape and resilience of the wire frame are retained in a hinge bracket on the filter to permit angular displacement of the filter about the so formed hinge.

3,722,950
CHAIR WITH REPLACEABLE UPHOLSTERY COVER

Robert Harnick, Parlin, N.J., assignor to Blair Manufacturing Co., Marietta, Ga.

Filed Dec. 3, 1971, Ser. No. 204,658
Int. Cl. A47c 7/02, 23/00
U.S. Cl. 297—218 7 Claims



The upholstery cover of a chair is readily removable so that a damaged cover may be rapidly replaced. Either the original cover or any replacement cover may be tufted.

3,722,951
VEHICLE PASSENGER SAFETY DEVICE

Raymond Ezquerra, 25 Place Nicolas Freimeaud, Tours, France

Continuation-in-part of Ser. No. 876,375, Nov. 13, 1969, abandoned. This application June 3, 1971, Ser. No. 149,684
Int. Cl. A47c 31/00
U.S. Cl. 297—390 10 Claims

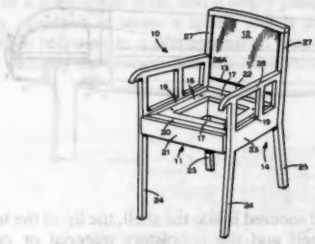
A device for protecting a passenger of an automotive vehicle in case of crash, accident and the like, this device comprising a bow-shaped element of which the intermediate portion is adapted to be disposed in front of the trunk of the person to be protected, and the side branches of the element extend to the rear and are pivoted to the upper portion of the seat, for example to a head-rest. Thus, in case of sudden forward projection of the passenger's or driver's trunk, the shoulders of the protected person will exert a certain pressure against the lateral branches of the device, thus causing the latter to pivot upwards to a position in which the head of the person is safely retained.

3,722,952
COLLAPSIBLE FURNITURE

Anatol Novitzky, 788 Columbus Avenue, New York, N.Y.

Filed May 17, 1971, Ser. No. 143,903
Int. Cl. A47c 4/02, 7/00
U.S. Cl. 297—440 10 Claims

Furniture such as chairs, arm chairs, tables or the like, which are collapsible; elements of the furniture being hingedly connected together to permit movement of the hinged elements between collapsed and set up conditions, together with

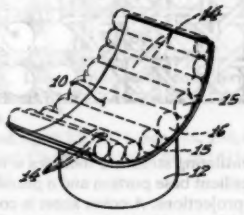


means rigidly locking the hinged elements together in their set up condition, yet being releasable to allow for collapse of the furniture.

3,722,953
FURNITURE FORMED OF ARCUATE AND CYLINDRICAL MEMBERS

James R. Hull, 10910 Kenross Avenue, Los Angeles, Calif.

Filed July 2, 1971, Ser. No. 159,410
Int. Cl. A47c 7/00, 7/20
U.S. Cl. 297—445 8 Claims



The invention is concerned with chairs, bed, sofas, tables, bookshelves, and other articles of furniture, which are formed of arcuate and cylindrical members which may be derived, for example, by cutting cardboard tubes into appropriate shapes. However, it will become evident as the description proceeds that although cardboard is a suitable material for the furniture, the furniture may be formed of arcuate and cylindrical members composed of metal, fiberglass, plastic, wood, or any other appropriate material, and the members need not necessarily be formed by cutting tubular members into the desired shapes.

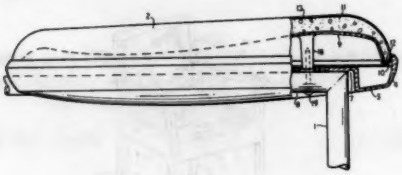
3,722,954
UPHOLSTERED FURNITURE

Ivor Allan Rey, Turramurra, New South Wales, and Victor Edmund Krout, Potts Point, New South Wales, both of Australia, assignors to Sebel Limited, New South Wales, Australia

Filed July 2, 1971, Ser. No. 159,341
Claims priority, application Australia, July 13, 1970, PA 1804
Int. Cl. A47c 7/14, 7/20
U.S. Cl. 297—452 4 Claims

A seat or backrest for a chair or other article of furniture is made from two moulded shells, one of which is inverted and seats within the other. Upholstery material is placed on the top

of the said one shell, upholstery cover material is stretched over the upholstery material and over a lip surrounding the



said one shell, and secured inside the shell, the lip of the inner shell retaining itself and the upholstery material or cover against a lip on the other shell.

3,722,955

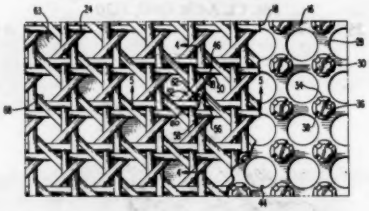
UNDERBODY VENTILATING STRUCTURE

Herbert H. Trotman, c/o Comfort Conditioning, Inc. P.O. Box 1046, Virginia Beach, Va.

Filed April 28, 1970, Ser. No. 32,642

Int. Cl. A47c *23/00*

U.S. Cl. 297—453 **18 Claims**



Underbody ventilating structure includes a ventilation grid sheet having a resilient base portion and a plurality of molded-in body-support projections. A cover sheet is coextensive with the grid sheet and has molded-in recessed portions defining a decorative pattern in the cover sheet such as a woven cane-simulating pattern. The body support projections maintain the cover sheet spaced from the base portion of the grid sheet, to form a ventilation space between the grid and cover sheets. The body-support projections are bonded to decorative recessed portions of the cover sheet, to eliminate scrubbing of the cover sheet across the grid sheet. The body-support projections can be rigid, or can be partially collapsible to yield with springlike action for increased comfort.

3,722,956

TRUCK FOR TENDING TEXTILE LOOM BATTERIES

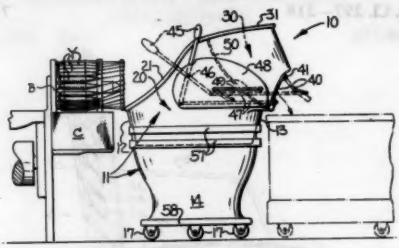
Roy Leon Lee, Fort Mill, and Lanneau Frazier Waldrop, Rock Hill, both of S.C., assignors to Springs Mills Inc., Ft. Mill, S.C.

Filed May 21, 1971, Ser. No. 145,733

Int. Cl. B60p *1/56*

U.S. Cl. 298—2 **4 Claims**

A movable truck for tending textile loom batteries including a housing having casters on the bottom thereof for easy moving of the truck by an operator from loom to loom, a first compartment for carrying full quills of yarn to replinish the batteries on looms, a second compartment for carrying empty quills removed from the looms, and a door associated with the second compartment and positioned upwardly from the base of the truck and including means for opening the door to empty the empty quills from the second compartment and for closing the door to accumulate the empty quills in the second compartment. The truck allows joint transportation of full quills of yarn to the looms for replinishment and empty quills



away from the looms eliminating separate transporting operations.

3,722,957

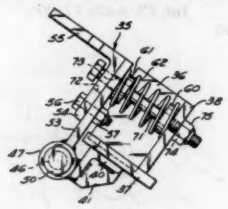
GAGE SCRAPER

Larry L. Snyder, and James R. Matlack, both of Solon, Ohio, assignors to Jarva, Inc., Solon, Ohio

Filed April 5, 1971, Ser. No. 130,982

Int. Cl. E01q *3/04*; E21c *25/10*

U.S. Cl. 299—86 **13 Claims**



A tunneling machine includes a support frame, a rotatable cutter head, and inside roller cutters and gage roller cutters for cutting or crushing the end face of a tunnel. Each gage cutter has a gage scraper with a scraper blade engaging the tunnel surface for clearing materials from the path of the gage cutter. A spring biases the scraper blade toward the tunnel surface, and the scraper blade is pivotally mounted with respect to the cutter head for movement toward and away from the tunnel surface along an arcuate path. A bolt head in the arcuate path provides an adjustable stop for preventing excessive outward travel of the scraper blade when a void is encountered in the tunnel surface. The bolt also provides a release means to displace the scraper blade away from the tunnel surface to permit removal of the scraper blade.

3,722,958

ROTATIVE WHEEL COVERS, AND THE LIKE

William H. Marshall, 1910 Missouri, Baytown, Tex.

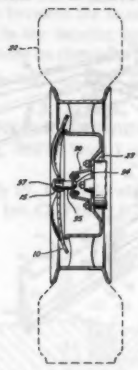
Continuation-in-part of Ser. No. 41,188, May 28, 1970, abandoned. This application Dec. 23, 1970, Ser. No. 100,904

Int. Cl. B60b *7/06*

U.S. Cl. 301—37 N **2 Claims**

Wheel covers and the like which are mounted for rotation independently of the wheel rotation. The apparatus may be af-

fixed to the usual hub caps of automotive vehicles, or may be affixed directly to the hub of the wheel assembly, or may be af-



fixed to the lugs which secure the wheel to the hub assembly. Preferably, for utmost safety, the wheel covers are disposed entirely within the limits of the surrounding tire.

3,722,959

HUB SHELL ASSEMBLY FOR A BICYCLE AND METHOD OF MAKING THE SAME

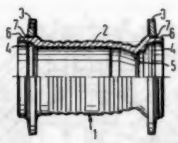
Theo Carbon, and Reinhard Kessler, both of Schweinfurt am Main, Germany, assignors to Frichtel & Sachs AG, Schweinfurt, Germany

Filed Dec. 22, 1970, Ser. No. 100,703

Claims priority, application Germany, Jan. 8, 1970, P 20 00 680.8

Int. Cl. B60b *27/04*

U.S. Cl. 301—105 B **2 Claims**



A hub shell for a bicycle wheel is assembled from two approximately semicylindrical sheet steel stampings by butt welding the axial edges of the stampings, machining the blank so produced to desired dimensions and details of sleeve contour, mounting annular flanges for the spokes on knurled outer faces of the sleeve, and deforming the exposed knurls to secure the flanges in position.

3,722,960

BRAKING SYSTEM FOR AUTOMOTIVE VEHICLES WITH MEANS FOR PREVENTING THE LOCKING OF WHEELS DURING BRAKING

Alexander Von Lowis OF Menar, Mauren, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

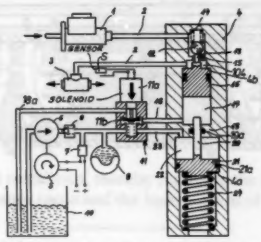
Filed Aug. 27, 1970, Ser. No. 67,416

Claims priority, application Germany, Sept. 17, 1969, P 19 47 012.3

Int. Cl. B60t *8/00*

U.S. Cl. 303—21 AF **12 Claims**

A braking system for the wheels of an automotive vehicle wherein the master cylinder is connected with the wheel cylinders by brake lines and can supply to the wheel cylinders a braking medium under such pressure that the wheels are locked and skid along the road surface. The braking system further includes devices which prevent prolonged locking of wheels in response to excessive pressurization of the braking medium, and each such device includes a shutoff valve which is provided in the respective brake line, a control piston which normally holds the shutoff valve in open position under the action of a pressurized fluid, and a safety plunger which is normally retracted to stress a spring and is displaced by such spring in response to a predetermined drop in the fluid pressure whereby the plunger maintains the shutoff valve in open



position by way of the control piston. The latter permits the shutoff valve to close when a sensor detects that the corresponding wheel is locked in response to excessive pressure of braking medium in the wheel cylinder; at the same time, the control piston increases the volume of a cylinder chamber which receives some braking medium to thus effect a reduction of pressure in the wheel cylinder and the termination of locking action.

3,722,961

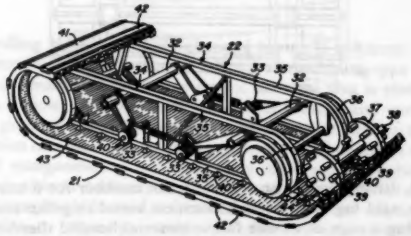
ENDLESS TRACK

John S. Haley, Lake Junaluska, and Jerry W. Cooper, Waynesville, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed April 22, 1971, Ser. No. 136,422

Int. Cl. B62m *27/02*; **B62d** *55/24*

U.S. Cl. 305—25 **16 Claims**



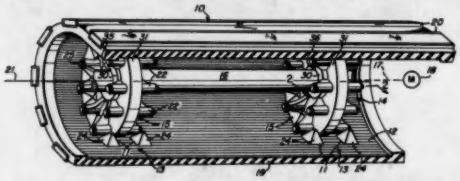
An endless track is provided which is particularly adapted to be supported by a slide rail suspension system and moved in an endless path thereabout. The endless track comprises a main body portion having a ground engaging surface and an inside surface and is provided with a plurality of bearing inserts fixed to the main body portion and such inserts comprise a part of the inside surface. Each of the inserts is arranged in an associated row which extends in an endless path and each insert has an outside bearing surface which is adapted to engage associated rails of the slide rail system for movement of the track about such slide rail system with optimum flexibility and in a substantially frictionless manner. Certain ones of the inserts may have means for guiding the track as it is moved along its slide rail system.

3,722,962

DRIVE SPROCKET

Jerry W. Cooper, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 10, 1971, Ser. No. 114,311
Int. Cl. B62d 55/12
U.S. Cl. 305—35 EB 10 Claims



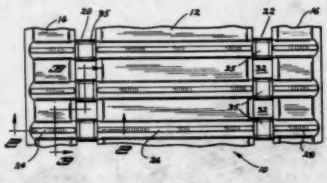
A drive sprocket for an endless traction belt which has a plurality of driven surfaces is provided wherein the sprocket has a plurality of driving members each supported for rotation relative to the sprocket and each being adapted to engage driven surfaces of the traction belt associated therewith in a serial manner to transmit a driving force thereto while avoiding sliding movement between each member and its associated driven surfaces to thereby reduce wear.

3,722,963

DRIVING LUG STRUCTURE FOR ENDLESS TRACK

Frank A. Cetrulo, Jr., Fort Thomas, Ky., assignor to National Factors, Inc., Cincinnati, Ohio

Filed Sept. 10, 1971, Ser. No. 179,313
Int. Cl. B62d 55/24
U.S. Cl. 305—38 2 Claims



A driving lug for an endless track member for a snowmobile, said lug comprising a seamless metal ring-like member having a core of rubber fabric material bonded thereto with said core having a transverse rod of said track member disposed therethrough and bonded thereto for a unitary construction.

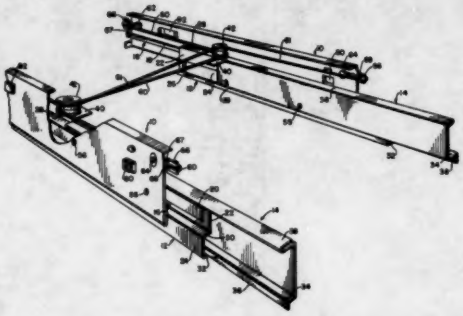
3,722,964

EXTENSIBLE DRAWER SUPPORT

John Alvin Chitester, Long Beach, and Frank D. Jonas, Oyster Bay, both of N.Y., assignors to Oxford Pendaflex Corporation, Garden City, N.Y.

Filed July 7, 1971, Ser. No. 160,378
Int. Cl. F16c 21/00
U.S. Cl. 308—3.8 3 Claims

An extensible drawer support for use with a file cabinet or the like includes a case mounting rail, a suspension rail, and a drawer mounting rail. The suspension rail is generally S-shaped in cross section with the upper portion thereof being supported on a spherical bearing retained within a flange extending inwardly from an intermediate portion of the case mounting rail. The bottom portion of the drawer mounting rail extends into the lower portion of the extension rail and is supported on a similar bearing within the suspension rail. Two additional spherical bearings serve to fix the position of the suspension rail relative to the case mounting rail and drawer rail, respectively.

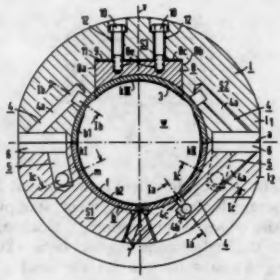


3,722,965

RADIAL SLIDE BEARINGS CONSTRUCTED AS THREE-WEDGE BEARINGS, PREFERABLY FOR TURBOMACHINES

Rudolf Gemein, Duisburg, and Gerold Holzer, Mulheim (Ruhr), both of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Jan. 21, 1972, Ser. No. 219,628
Claims priority, application Germany, Jan. 25, 1971, P 21 03 239.3
Int. Cl. F16c 17/16
U.S. Cl. 308—122 4 Claims



Radial slide bearing in the form of a three wedge bearing includes a bearing shell formed of an upper and a lower longitudinal half shell, a bearing bushing mounted in the shell and formed with shaft-bearing surfaces on the inner periphery thereof, the bearing shell and bearing bushing being comprised of three radial wedge segments with respective sickle-shaped spaces distributed over the inner periphery for building up therein wedges of lubrication for lubricating a rotary shaft receivable in the bearing bushing, the sickle-shaped spaces each having a leading edge in direction of rotation of the shaft, oil inlet channels formed in the bearing shell and the bearing bushing and communicating with the respective spaces at the leading edges thereof, and oil outlet channels also formed in the bearing shell and the bearing bushing and communicating with the respective spaces at a location thereof downstream from the leading edges thereof, one of the three wedge segments being located at the top of the bearing shell and extending over the bearing surface at the upper half shell substantially concentrically to the vertical axial plane of

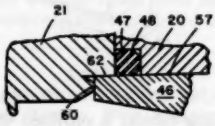
the bearing shell, the upper wedge segment including an adjusting segment wherein the respective sickle-shaped space of the upper wedge segment is formed, the adjusting segment being adjustably mounted in the bearing shell for adjusting lubrication clearance between the bearing surface thereof and the shaft receivable in the bearing bushing so as to vary oil pressure forces exertable on the upper part of the shaft.

3,722,966

FLUID SEAL MEANS SURROUNDING BEARING MEANS

George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

Filed July 19, 1971, Ser. No. 163,707
Int. Cl. F16c *33/76*
U.S. Cl. 308—187.1 5 Claims



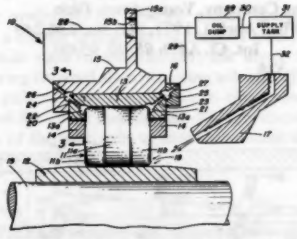
Fluid seal means surrounds bearing means and includes a step-shoulder which defines with said bearing means an annular groove to receive an O-ring seal.

3,722,967

LOW HEAT GENERATION TURBINE ENGINE BEARING

Harry R. Lewis, Arlington, Va., assignor to The United States of America as represent by the Secretary of the Navy

Filed Oct. 26, 1971, Ser. No. 191,980
Int. Cl. E16c *33/30*
U.S. Cl. 308—187 14 Claims



A low heat generation roller bearing having inner and outer races. Oil is applied to the surface where the rollers and inner race contact by means of an oil jet nozzle. Centrifugal force and rotation of the rollers, forces the oil around the rollers to the outer race. Radial bores extend through the outer race and connect with one or more circumferential grooves to collect and aid in transmission of oil from the outer race. A path is provided to return the oil to an oil sump for scavenging back to an oil supply tank.

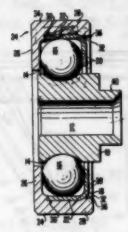
3,722,968

WHEEL-BEARING ASSEMBLY

Arthur L. Bomberger, Lancaster, Pa., assignor to National Bearings Company, Lancaster, Pa.

Filed June 29, 1967, Ser. No. 649,986
Int. Cl. F16c *33/30*
U.S. Cl. 308—191 6 Claims

A ball bearing-wheel assembly has an outer nylon tire partially enclosing a stamped metal cup which serves as the outer race for the balls. The nylon tire has the inner surface of its peripheral wall adapted to securely engage the peripheral wall



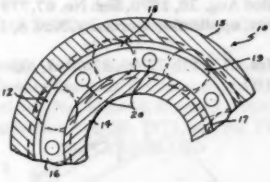
of the stamped metal cup, thereby retaining the balls between the inner and outer races and the base portion of the tire.

3,722,969

BALL AND ROLLER BEARING RETAINER IMPROVEMENT FOR HIGH SPEED OPERATION

Phillip R. Eklund, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed Jan. 4, 1972, Ser. No. 215,314
Int. Cl. E16c *33/00*
U.S. Cl. 308—193 7 Claims



A rolling bearing-retainer element having a substrate or base structure manufactured from a free-machining-type of relatively manganese-rich tool and/or die steel that is plated with a deposit of silver after being heat treated and cured under predetermined temperature conditions that ensures the formation of a base surface microstructure that includes a series of manganese sulphide spheroids dispersed throughout and a combined surface microstructure in which a silver sulphide complex is formed at each of the manganese sulphide spheroids to thereby provide a relatively non-yieldable retainer element having substantially less friction and significantly improved resistance to galling, wear and fatigue.

3,722,970

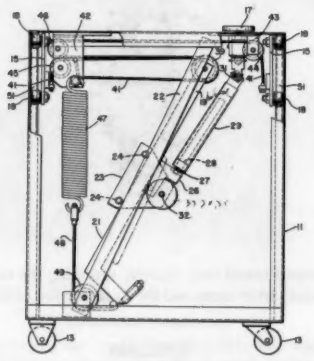
DISPENSING APPARATUS

James W. Healy, Wakefield, Mass., assignor to Peters & Co. Inc., Boston, Mass.

Filed April 19, 1971, Ser. No. 135,100
Int. Cl. A47f *1/00*; B65g *1/16*
U.S. Cl. 312—71 38 Claims

A dispensing apparatus of the self-leveling type in which a vertically movable platform is balanced by a spring and in which a balance beam is interposed between the spring and the platform to permit adjustment for different types of materials carried on the platform. Among the features shown are adjustment of effective moments by moving the fulcrum

while constraining the beam longitudinally; moving the fulcrum with gear, rack, and stationary track; moving the fulcrum by pivotal link; rolling of surfaces in the fulcrum region; constraining the beam by a pivotal link connected at a point



spaced from the fulcrum; vertical arrangement of the beam and adjusting rod in a compact arrangement; and a multiple parallel support cord arrangement, together with other important related features.

3,722,971

PLASTIC BOX FURNITURE

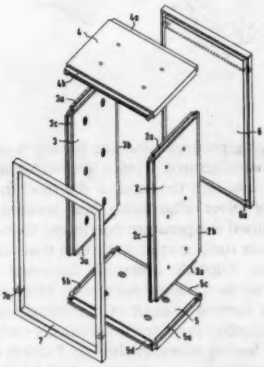
Walter Zeischegg, 7910 Neu-Ulm, Germany, assignor to Hans Friedrich Hefendehl, Kierspe, Germany

Filed Aug. 28, 1970, Ser. No. 67,779

Claims priority, application Germany, Nov. 6, 1969, P 19 55 922.9

Int. Cl. A47b *77/00, 87/00, 81/00*

U.S. Cl. 312—107 **7 Claims**



Plastic box furniture is made up of at least one rectangular box member open on at least one side. The box member is constructed of individual side panels fitted together along adjoining edges and secured together around the periphery of the open side by a frame. Preferably, the side panels are made of a hollow construction, formed by a pair of spaced wall members joined together along their edges to provide ribs or grooves for interconnecting the panels. Each of the panels can be provided with openings to receive bolt-like members for securing separate box members together in a furniture arrangement. The box member can be arranged to receive a drawer inserted through its open side, or the open side can be closed by a door or a cover.

3,722,972

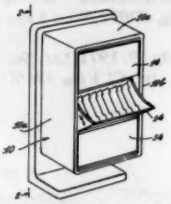
FIBERGLASS FILING CABINET

Douglas Deeds, San Diego, and Barry L. Rosengrant, Los Angeles, both of Calif., assignors to Architectural Pottery, Los Angeles, Calif.

Filed June 28, 1971, Ser. No. 157,278

Int. Cl. A47b *88/18;* **E05d** *7/04*

U.S. Cl. 312—305 **3 Claims**



An improved filing cabinet is provided which lends itself particularly to a double-walled fiberglass construction. The filing cabinet of the invention includes a molded fiberglass base which defines a rectangular frame normally disposed in a vertical plane. One or more file drawers are supported within the frame above one another, the support of each drawer being effectuated by elongated strips mounted on the ends thereof. The strips are supported in depressions formed in the inner wall of the frame, the depressions having the shape of an inverted triangle, so as to permit each drawer to be independently tilted out from the frame for access to its interior, and then to be tilted back to an upright position within the frame.

3,722,973

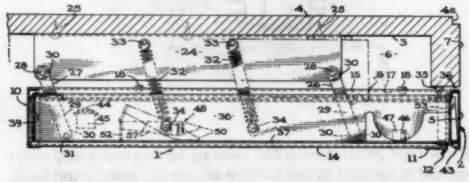
FURNITURE ARTICLE WITH DISPLACEABLE DRAWER CASE

Melvin A. Textoris, Struthers, Ohio, assignor to The General Fireproofing Company, Youngstown, Ohio

Filed April 1, 1971, Ser. No. 130,249

Int. Cl. A47b *88/00, 95/00*

U.S. Cl. 312—325 **11 Claim**



A furniture article having a top supporting surface includes a drawer case assembly mounted beneath said surface and displaceable from an elevated stored position normally hidden from the user's view, to a lowered use position horizontally offset from the stored position to allow subsequent rectilinear movement of a drawer carried by the assembly.

3,722,974

DRAWER SIDE WALL

David A. Hartman, 3226 Vernon Ave., Elkhart, Ind.

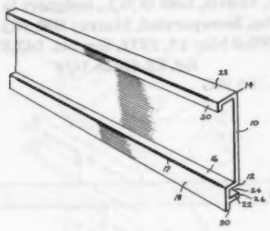
Filed July 15, 1969, Ser. No. 841,809

Int. Cl. A47b *88/00*

U.S. Cl. 312—330 **9 Claims**

A side wall for a drawer defined by a substantially vertical panel member having an outwardly offset lower margin which

is interconnected to the remainder of the panel member by a substantially horizontal web. A flange extends inwardly from



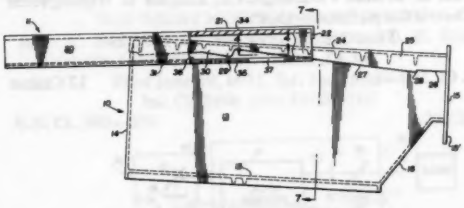
an intermediate portion of the offset lower margin and cooperates with the web and offset lower margin to define a channel for the receipt of a side margin of a drawer bottom.

3,722,975

TILT-OPEN DRAWER CONSTRUCTION

William D. Taylor, Wooster, Ohio, assignor to Rubbermaid, Inc., Wooster, Ohio

Filed Jan. 3, 1972, Ser. No. 214,709
Int. Cl. A47b *88/00*
U.S. Cl. 312—348 **2 Claims**



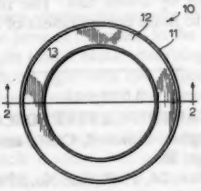
A drawer preferably of molded plastic material slidably mounted in a carrier frame having channel side rails slidably supporting side rails on the drawer, the lower legs of said channels having forward slots receiving selectively projections on the side rails to hold the drawer in closed and full open positions, and the upper channel legs slidably abutting the rear upper edges of the side rails to limit downward tilting of the drawer in open positions.

3,722,976

MERCURY GENERATION

Paolo Della Porta, and Mauro Rebaudo, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Division of Ser. No. 78,839, Oct. 7, 1970, Pat. No. 3,657,589.
This application Jan. 18, 1972, Ser. No. 218,755
Int. Cl. H01j *9/38*
U.S. Cl. 316—3 **7 Claims**



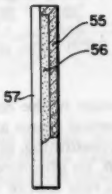
Mercury releasing getter devices employing intermetallic compounds of mercury with zirconium and/or titanium such as Zr_3Hg and Ti_3Hg related compositions of matter and uses thereof to charge electron tubes with mercury.

3,722,977

OPTICAL SCATTERING FILTER

Howard J. Sloane, Fullerton, Calif., assignor to Beckman Instruments, Inc.

Continuation of Ser. No. 348,387, March 2, 1964, abandoned.
This application Aug. 30, 1971, Ser. No. 176,231
Int. Cl. G02b *5/22*
U.S. Cl. 350—1 **22 Claims**



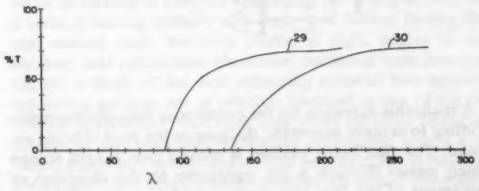
Long pass optical filters for the infrared region and methods of making the same are disclosed which utilize a transmitting matrix of high and low refractive index materials for selectively scattering all wavelengths shorter than a critical wavelength and which have a relatively sharp cut-on front. By the inclusion of materials having absorption bands at wavelengths longer than the cut-on wavelength of the scattering medium, the cut-on front may be sharpened and positioned over a wide range to provide a filter having a preselected cut-on wavelength and cut-on front.

3,722,978

OPTICAL SCATTERING FILTER WITH HYGROSCOPIC MATERIAL

Howard J. Sloane, and Gerald T. Keahl, both of Fullerton, Calif., assignors to Beckman Instruments, Inc.

Continuation of Ser. No. 348,444, March 2, 1964, abandoned.
This application Aug. 30, 1971, Ser. No. 176,232
Int. Cl. G02b *5/22*
U.S. Cl. 350—1 **11 Claims**



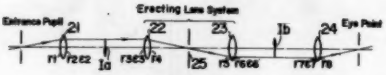
Long pass optical filters for the infrared region and methods of making the same are disclosed which utilize a transmitting matrix of high and low refractive index materials for selectively scattering all wavelengths shorter than a critical wavelength and which have a relatively sharp cut-on front. By the inclusion of materials having absorption bands at wavelengths longer than the cut-on wavelength of the scattering medium, the cut-on front may be sharpened and positioned over a wide range to provide a filter having a preselected cut-on wavelength and cut-on front. The absorbing materials may include one or more hygroscopic materials whose particles tend to coalesce when finely divided. By adding small quantities of a highly refined mineral oil and mulling before die pressing while heating, these materials may be evenly distributed throughout the area of the filter.

3,722,979

OPTICAL SYSTEM OF THE REAL IMAGE TYPE FOR FINDERS HAVING ASPHERIC SURFACES

Nobunao Mikami, Yokohama, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 27, 1971, Ser. No. 147,532
Claims priority, application Japan, June 1, 1970, 45/47405
Int. Cl. G02b 23/00
U.S. Cl. 350—54 2 Claims



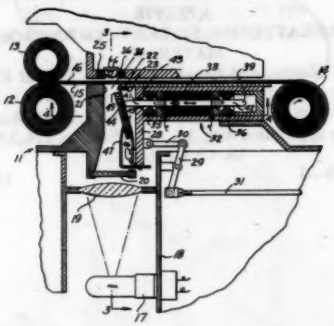
A finder optical system of the real image type comprises four identical non-spherical lenses arranged on a single common optical axis and constituting, in the direction of incident light rays therethrough, an objective lens, a front lens of an erecting lens system, a rear lens of the erecting lens system, and an eyepiece. A small diaphragm may be arranged between the front and rear lenses of the erecting lens system, or at another selected location along the optical axis.

3,722,980

MALLEABLE EXPOSURE SLIT FOR A CONTINUOUS STRIP PHOTOGRAPHIC PRINTER

Dwin Richardson Craig, Gaithersburg, Md., assignor to Joseph F. Balac; Felix P. Tolssa, both of Vienna, Va.

Filed Feb. 16, 1972, Ser. No. 226,896
Int. Cl. G03b 27/76
U.S. Cl. 355—83 5 Claims



A malleable exposure slit for continuous strip photographic printing to achieve automatic dodging as the print is being exposed. The film being printed is moved past a light source which passes through a slit transverse to the direction of movement of the film and exposes a positive material positioned against the film and moving therewith. The light passing through the film and positive material strikes equally spaced photoelectric cells positioned above the film and positive material to produce electrical energy in direct ratio to the light reaching the photo-electric cell. Each photo-electric cell is connected through an amplifier to an electro-mechanical piston with the piston arranged to underlie the film with the same transverse spacing as the photo-electric cells. A flexible membrane extends completely along one side of the slit to form one edge of the slit with the electro-mechanical piston engaged thereagainst. Movement of the pistons in a direction toward the slit pushes the flexible membrance into the slit to reduce the overall size of the slit at the point underlying the photoelectric cell controlling the specific piston. The flexible membrance is pressed into a harmonious curve to increase and decrease the area permitted for the light to pass in the slit in accordance with the light reaching the photo-electric cells.

3,722,981

LOW MELTING POINT OPTICAL TRANSMISSION LINE

Douglas A. Pinnow, Berkeley Heights, and Le Grand Gerard Van Uitert, Morris, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 17, 1971, Ser. No. 143,877
Int. Cl. G02b 5/14
U.S. Cl. 350—96 WG 16 Claims

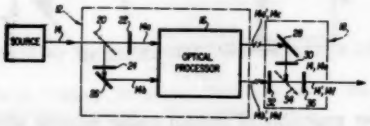
Use of material selected from classes of low-melting water-soluble glasses is found to result in low Rayleigh scattering loss. Decreased insertion loss due to this mechanism becomes significant when losses due to other mechanisms have been minimized. Reduction of ultimate insertion loss relative to the more usual insoluble high-melting glasses may justify the additional expense incurred in designing protective systems.

3,722,982

COHERENT OPTICAL PROCESSING METHOD AND SYSTEM HAVING IMPROVED SIGNAL-TO-NOISE RATIO UTILIZING POLARIZING FILTERS

Gerald B. Brandt, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1971, Ser. No. 192,522
Int. Cl. G02b 27/28; H04b 9/00
U.S. Cl. 350—147 12 Claims



A coherent optical processing method and system for improving signal to noise ratio. A coherent optical beam which can be polarized or unpolarized is split into two component beams which are then polarized to two separate orthogonal states of polarization. Each component beam is operated upon to impart information thereto or sent through a transmission channel during which operation and transmission a small portion of each component beam is unavoidably scattered and depolarized. Each component beam is thereafter optically filtered with a polarizer aligned with the polarization state of each component beam, thereby removing approximately half of the depolarized noise portions of each component beam. The filtered component beams are then recombined, forming a polarized beam with a noise component depolarized with respect to the polarization beam. The combined polarized beam is again filtered in a polarizer aligned with the polarization state of the combined beam to reduce the depolarized noise portion again by about half. The resultant polarized beam has a signal to noise enhancement of about four by the inventive system.

3,722,983

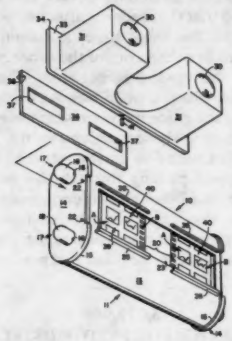
TWIN TRACK CARTRIDGE STEREOSCOPIC VIEWER

Samuel M. Brassington, Concord, Calif., assignor to Material Flow Inc., Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,166
Int. Cl. G02b 27/22
U.S. Cl. 350—135 1 Claim

A stereoscopic viewer employs a film strip having two tracks of matched stereoscopic prints or frames which are wound in a magazine for reel-to-reel transport between spaced-apart reels and a binocular eyepiece slidably mounted

on the magazine whereby the magazine can be shifted to view the frames in one track as the film is advanced in one direction by the reels and to view the frames of the other track as the



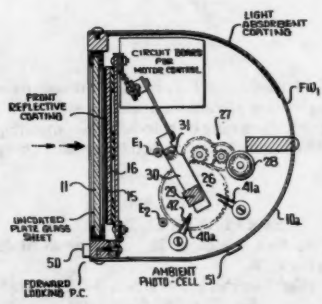
film is advanced in the opposite direction or can be intermittently shifted to the adjacent track for correlating related information on the two tracks.

3,722,984

DAY-NIGHT MIRROR FOR VEHICLES

John W. Brean, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed June 29, 1971, Ser. No. 157,941
Int. Cl. B60r 1/06; G02b 7/18
U.S. Cl. 350—280 **21 Claims**



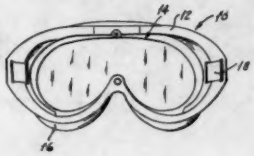
A system for simultaneously sensing, by means of photo-resistors, ambient light and light from an energized headlamp from a vehicle following a vehicle, and in response to the signal outputs of the photo-resistors causing an oscillatory mirror to move selectively into proximity and parallel with a sheet of glass facing always rearwardly of the truck, or, into 45° relation to the pane of the glass. In the latter condition the mirror reflects light into a black absorbing surface, while the sheet of glass reflects light with low efficiency to the eyes of the driver of the truck, whereas in the former condition mirror reflects light with high efficiency to the eyes of the driver. The mirror is in the parallel position during daylight and at night if no following vehicle is close, but goes to the 45° position at night if a following headlamp is sensed. To avoid plural images, the mirror is made of a sheet of glass which is aluminum coated on its front surface, so that light does not pass through the glass of the mirror in proceeding from the following headlamp to the eye of the driver. Electric current is passed through the aluminum coating of the mirror to generate heat and thus to maintain the mirror and the inner surface of the first mentioned sheet of glass free of ice and fog.

3,722,985

NIGHT-VISION TRAINING GOGGLES

Albert J. Laliberte, Woodstock, Conn., and Ralph A. Richardson, North Brookfield, Mass., assignors to Omnitech Inc., Southbridge, Mass.

Filed Sept. 4, 1970, Ser. No. 69,854
Int. Cl. G02b 5/20
U.S. Cl. 350—311 **7 Claims**



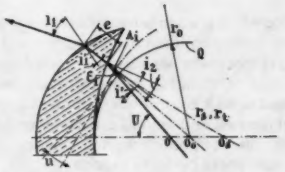
A night-vision training goggles lens formed as a unitary piece covering both eyes from a single thickness of a press-polished, dark-green-transparent sheet of synthetic resin having a color response providing a visual transmittance peak at a wave length between 5400 A. and 5600 A. and having an optical density between six and seven.

3,722,986

HIGH TORIC POWER OPHTHALMIC LENSES

Luc Andre Marcel Tagnon, 6 rue Pastourelle, Paris, France

Continuation-in-part of Ser. No. 771,143, Oct. 28, 1968, abandoned. This application Oct. 18, 1971, Ser. No. 190,058
Claims priority, application France, July 26, 1968, 160767; Oct. 30, 1967, 126369
Int. Cl. G02c 7/02
U.S. Cl. 351—176 **9 Claims**



An ophthalmic aberration corrected toric lens which is derived from a basic toric lens, said basic lens having on a block of refringent material a spherical refracting surface and a toric refracting surface, said basic lens further having first and second main meridian planes at right angles to one another, said ophthalmic aberration corrected toric lens having on a block of the said refracting material two opposite refracting surfaces one of which is identical to one of the two refracting surfaces of said basic lens, while the other refracting surface of said aberration corrected ophthalmic lens is a so-called aberration minimizing surface and is shaped to maintain astigmatism and field curvature aberrations of said ophthalmic lens less than ± 0.50 Diopters.

3,722,987

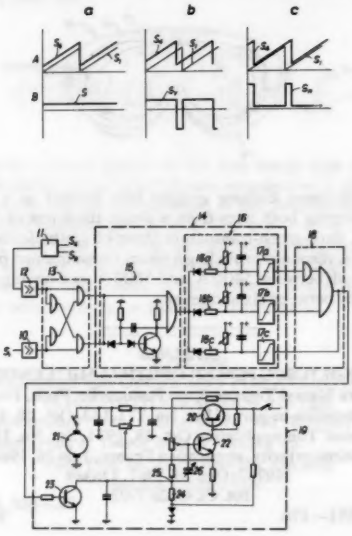
AUTOMATIC SYNCHRONIZATION OF TWO STRIP DRIVES

Heinrich Cap, Josef Drasch, both of Vienna; Edgar Miesbichler, Vosendorf; Gottfried Pammer, Sudstadt; Robert Scheiber, and Harald Wessner, both of Vienna, all of Austria, assignors to Karl Vochenhuba; Raimund Hauser, both of Vienna, Austria

Filed June 25, 1971, Ser. No. 156,626
Claims priority, application Austria, June 25, 1970, 5740; July 10, 1970, 6337; July 10, 1970, 6338; Nov. 11, 1970, 10166
Int. Cl. G03b 31/04
U.S. Cl. 352—17 **46 Claims**

A process of synchronizing first drive means for moving a first strip and second drive means for moving a second strip

comprising the steps of operating the first drive means to move the first strip having a first signal recorded thereon on predetermined length portions and reproducing the first signal from the first strip as the latter is thus moved, operating the second drive means to move the second strip, and generating a second signal in response to the movement of the second strip. Providing with each of the first and second signals at least one



varying parameter, at least in portions of the signals which are associated with predetermined length portions of the first and second strips, respectively, which parameters have a predetermined functional relationship to each other, comparing the first and second signals to produce a control signal, and controlling one of the first and second drive means to maintain the control signal at a predetermined value, indicating a synchronous movement of the two strips.

3,722,988

MOTION PICTURE PROJECTOR FOR USE WITH FILM-CONTAINING CASSETTES

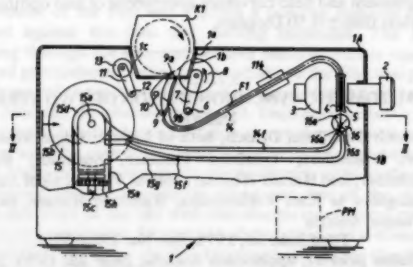
Karl Neudecker, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed June 22, 1971, Ser. No. 155,467

Claims priority, application Germany, June 23, 1970, P 20 31 005.8

Int. Cl. G03b *23/00*

U.S. Cl. 352—125 **16 Claims**



A motion picture projector wherein two takeup reels are pivotable about vertical axes together with hollow guide members having inlets movable into and out of register with the slot of a switching device. The housing of the projector supports a set of cassettes which are movable sideways to assume a viewing position and thereupon a rewinding position. An automatic film threading mechanism advances the leader of film in the cassette occupying the viewing position behind the projection lens, through the switching device and into one of the guide members so that the leader is attached to the core of the respective reel. At the same time, a rewinding mechanism transports the film from the core of the other reel into the cassette occupying the rewinding position. The reels and the guide members are pivoted whenever the cassettes are shifted by a step whereby the guide member which moves out of registry with the switching device withdraws the respective film from the slot so that such film can be returned into the respective cassette without passing through the switching device. The latter is pivotable between two end positions to place the outlet of its slot into registry with the inlet of one guide member in one end position and into registry with the inlet of the other guide member in the other end position.

3,722,989

CONTROL DEVICE FOR MOTOR DRIVEN MOTION PICTURE CAMERA

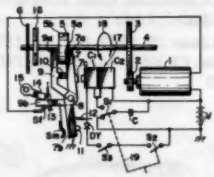
Yoshimitsu Inoue, Osaka, Japan, assignor to Minolta Camera Kabushika, Kaisha, Osako-fu, Japan

Filed June 30, 1971, Ser. No. 158,206

Claims priority, application Japan, June 30, 1970, 45/57139

Int. Cl. G03b *19/18*

U.S. Cl. 352—137 **5 Claims**



A motion picture camera is provided with controls for selectively taking motion picture sequences or still shots. The exposure of the still shots may be selected by controlling the open period of the shutter. In this way bulb exposures may be made.

3,722,990

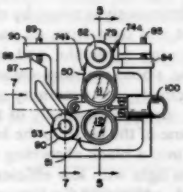
EVR PLAYER LENS SYSTEM

Daniel J. Vondran, Chicago, Ill., assignor to Motorola Inc., Franklin Park, Ill.

Filed March 16, 1971, Ser. No. 124,839

Int. Cl. G03b *1/48, 3/00*

U.S. Cl. 352—231 **13 Claims**



An Electronic Video Recording (EVR) player has a flying spot scanner tube for producing a raster which is focused by a lens system upon a film moving across openings in a film gate. The lenses in the lens system are eccentrically mounted in a frame and are provided with a focusing adjustment and a centering adjustment so that proper alignment of the lens system with the film gate and the flying spot scanner tube may be effected. Included in the film gate assembly is a sub-assembly for

mounting film gate prisms and the synchronizing light in a single unit which is attached to the film gate and mounted in the frame which holds the lens systems. Flanges are provided on the film gate to protect the prisms against damage. Collector prisms are mounted on a collector prism frame for collecting light passing through the film gate openings and may be vertically adjusted for alignment with the openings. The collector prisms are clamped together along with a synchronizing light pick-up filament by a metal band which holds these optical elements together.

3,722,991

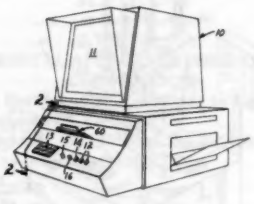
MICROFICHE POSITIONING APPARATUS

Arthur J. Edhlund, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 4, 1970, Ser. No. 34,293

Int. Cl. G03b *23/08, 25/52*

U.S. Cl. 353—27 **6 Claims**



A microfiche reader/printer having a movable microfiche positioning apparatus that may be readily adjusted for accommodating the reader/printer to different microfiche formats. The positioning apparatus includes a support frame, a transport frame movable relative to the support frame along a first axis, and a microfiche carriage supported by the transport frame and movable parallel to a second axis. A first circuit board is secured to the support frame and includes first and third coded conductive patterns. A first follower, secured to the transport frame, has a first electrical contact and third electrical contact to engage the first and third coded conductive patterns. A second circuit board is secured to the transport frame and includes second and fourth coded conductive patterns. A second follower, secured to the microfiche carriage, has a second electrical contact and fourth electrical contact to engage the second and fourth coded conductive patterns. The first and second circuit boards may be readily replaced with alternative circuit boards for accommodating the microfiche reader/printer to various microfiche formats. Encoding selector buttons and binary switches electrically connected to the third and fourth coded conductive patterns provide predetermined termination of the automatic sequential copying of the microframes.

3,722,992

APPARATUS FOR CREATING AN ELECTROSTATIC LATENT IMAGE BY CHARGE MODULATION

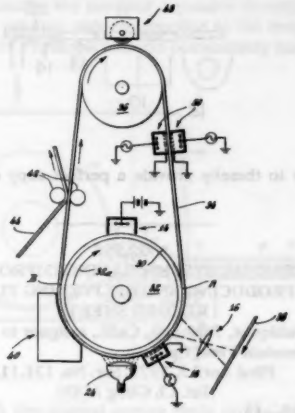
Gilbert Zweig, Stamford, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 11, 1971, Ser. No. 105,432

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **4 Claims**

A transparent dielectric film is juxtaposed with the electrostatically charged surface of a photoconductive member. An optical image is projected onto the photoconductive member to create a corresponding first electrostatic latent image on the photoconductive member surface. The exposed dielectric film surface is charged by an AC scorotron; the first electrostatic latent image acting to modulate the charge deposition such as to produce a zero potential at the exposed film surface. The photoconductive member is flooded with light to dissipate the first electrostatic latent image, rendering the charge deposition on the exposed film surface effective as a



second corresponding electrostatic latent image for ultimate development and image transfer to plain paper.

3,722,993

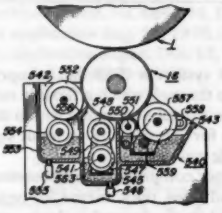
MATERIALS APPLICATION APPARATUS

Raymond Keith Egnaczak, Williamson, N.Y., assignor to Xerox Corporation,, Rochester, N.Y.

Filed April 21, 1972, Ser. No. 246,446

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 **7 Claims**



A modular imaging electrode assembly for supplying liquids in automated imaging machines. The unit has a tank holding a roller coupled to an electrical source. The roller is driven past a liquid applying and leveling apparatus and then contacts an imaging member of the machine in which it is located. The tank which is elevated into and out of contact with the member of the machine has two or more sections. The first houses the apparatus to apply liquid to the roller and the second has cleaning brushes in it to remove any materials remaining on the roller. Optionally, a third section applies a different liquid to the roller. The sections are separated by squeegees for preventing material in the one section from affecting that in another.

3,722,994

METHOD AND DEVICE FOR REMOVING DEVELOPING LIQUID

Hiroshi Tanaka; Takashi Saito; Shusei Tsukada; Toru Takahashi, all of Tokyo, and Hajime Katayama, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1970, Ser. No. 41,151

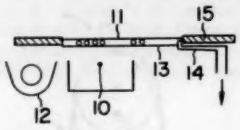
Claims priority, application Japan, June 4, 1969, 44/44164

Int. Cl. G03g *9/04*

U.S. Cl. 355—10 **24 Claims**

A method and device used with an electronic photocopying apparatus and for removing any residual developing solution

from a photosensitive member by the use of a corona



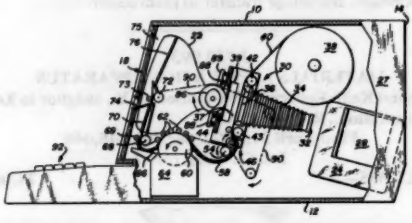
discharger to thereby provide a perfect copy of an original image.

3,722,995

DATA TERMINAL SYSTEM HAVING IMPROVED MEANS FOR PRODUCING AND DELIVERING FLEXIBLE RECORD SHEETS

John A. Dahlquist, Palo Alto, Calif., assignor to Photophysics, Inc., Mountain View, Calif.

Filed April 5, 1971, Ser. No. 131,113
Int. Cl. G03g *15/00*
U.S. Cl. 355—13 **19 Claims**



A data terminal system is disclosed comprising a housing having an aperture through which a flexible record sheet may exit, a first cathode ray tube mounted within the housing, and conductive means for transmitting an input signal to the first and second cathode ray tubes.

The system further comprises a photoconductive plate having first and second sides, optic means for projecting an optical image displayed by the second cathode ray tube onto the first side of the photoconductive plate, a conductive base plate mounted in spaced juxtaposition with the second side of the photoconductive plate, the conductive base plate and the photoconductive plate defining an image transfer station therebetween, and means for applying a voltage across the second side of the photoconductive plate and the conductive base plate.

The system further comprises first feed means for intermittently feeding successive portions of an elongated strip of flexible dielectric-coated paper upon which a latent electrostatic image may be formed into the image transfer station, means for severing the successive portions of the elongated strip of flexible dielectric paper into individual flexible record sheets, toner means for developing the latent electrostatic images after the successive portions of the elongated strip of flexible dielectric-coated paper have been severed into individual record sheets, and second feed means for intermittently feeding the individual flexible record sheets from the image transfer station through the toner means and out through the housing aperture.

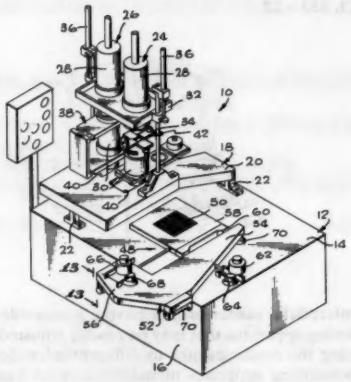
Inverting means for inverting record sheets moving within the system's housing in a generally horizontal direction towards the exit aperture are also disclosed. The inverting means comprises a set of parallel rollers disposed in mutual engagement substantially parallel a generally upright housing front member which defines the exit aperture. At least one of the rollers is linked by a transmission drive means with a motor disposed within the system housing. The inverting means further comprises guide means for guiding the flexible record sheets moving in a generally horizontal direction upwardly into engagement with the set of rollers, and baffle means including a generally upright baffel disposed above the set of rollers in spaced juxtaposition with the upright housing front member.

3,722,996

OPTICAL PATTERN GENERATOR OR REPEATING PROJECTOR OR THE LIKE

Wayne L. Fox, Castro Valley, Calif., assignor to Electromask, Inc., Van Nuys, Calif.

Filed Jan. 4, 1971, Ser. No. 103,524
Int. Cl. G03b *27/42*
U.S. Cl. 355—53 **17 Claims**



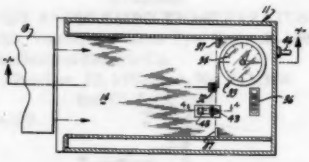
A machine for photographically generating and/or reproducing a selected pattern on a light sensitive emulsion plate. The machine includes a moveable stage for supporting the emulsion plate, either or both an optical pattern generating projector and an optical pattern reproducing or repeating projector each having a longitudinally floating fixed focus lens barrel and a light source for directing a light beam through the barrel onto the emulsion plate, means for driving the stage to translate the emulsion plate edgewise in a prescribed motion opposite the lens barrel of either projector in such a way as to successively locate predetermined positions or addresses of the plate on the barrel axis, and means for flashing the projector light beam at preselected addresses of the emulsion plate in response to control information programmed into the machine. In its pattern generating mode, the machine is programmed to flash the light source of the pattern generating projector in such as way as to produce on the emulsion plate a latent image of a selected pattern. In its pattern repeating mode, a transparent slide or tooling plate bearing a pattern to be repeated, is inserted into the photo repeating projector and the machine is programmed to flash the projector light source at selected addresses of the emulsion plate to produce a latent image of the pattern at each selected address. The primary application of the machine involves the production of photomasks for electronic microcircuit patterns. Major features of the machine reside in an air bearing system with a moveable stage, an air gauging system for positioning each projector lens barrel relative to the emulsion plate to maintain the plate in the image plane of the projector, and a laser interferometry system for sensing the position of the moveable stage along mutually perpendicular axes and controlling the stage drive means to reflect precise positioning of each emulsion plate address on the optic axis of each projector lens barrel.

3,722,997

CHECKING AND CANCELING DEVICE

Phyllis E. Mendoza, 208 Anza Vista Avenue, San Francisco, Calif.

Filed May 24, 1971, Ser. No. 146,140
Int. Cl. G03b 17/24
U.S. Cl. 355—64 4 Claims



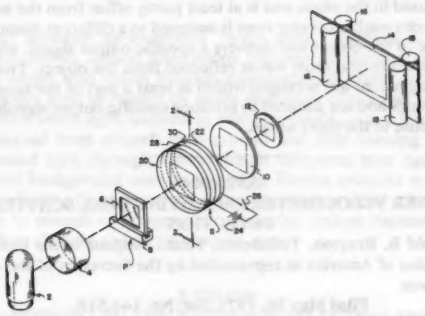
A device for utilization with checks or bills as may be employed in restaurants, for example, to photograph same with the time and date of photography as well as to mark the bills so as to preclude peculations, including those involving collusion.

3,722,998

LIQUID CRYSTAL APPARATUS FOR REDUCING CONTRAST

John E. Morse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,959
Int. Cl. G03b 27/76
U.S. Cl. 355—71 6 Claims



An apparatus is provided for masking a projected image from a slide transparency which apparatus includes interposing in the projection path a photoconductor-liquid crystal sandwich comprising a layered structure having in order, a first transparent electrode, a transparent layer, a liquid crystal layer and a second transparent electrode, and including means for applying a potential between the transparent electrodes. Upon projection of the transparency image, the lighter areas will cause the photoconductive material to become more conductive than will the darker areas so that the corresponding areas of the liquid crystal layer will become diffuse thereby diffusing some of the light away from the optical system in the brighter areas to provide an image on the photosensitive surface which has less contrast than the original transparency image.

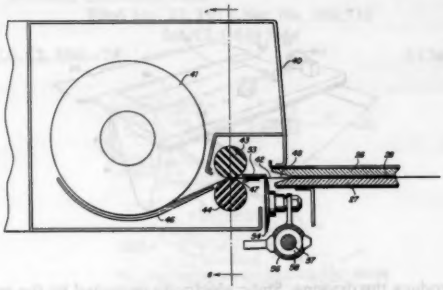
3,722,999

COPYING APPARATUS HAVING CASSETTE AND CUTTING MEANS

Harold Cunha, Pittsford; William M. Dickman, Canandaigua, and Daniel H. Robbins, Rochester, all of N.Y., assignors to Itek Corporation, Lexington, Mass.

Filed Aug. 19, 1971, Ser. No. 173,194
Int. Cl. G03b 27/58
U.S. Cl. 355—45 12 Claims

Reader-printer apparatus for viewing an image of the information stored on a data storage medium and for producing large sized, uniform intensity, printed copies of that information. The apparatus is designed to permit both viewing and printing to be accomplished at a single imaging station on the machine, eliminating the need for expensive movable optics. Photosensitive printing paper is supplied to the imaging station by means of a reusable cassette conveniently mounted to



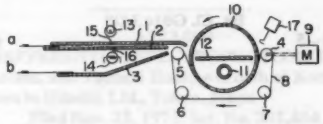
the machine. A disc-shaped cutting blade on the machine is adapted to cooperate with a stationary blade on the cassette to smoothly and rapidly cut the exposed paper in a manner so as to minimize paper waste due to fogging, jamming or tearing. The machine is particularly designed to produce high quality uniform intensity prints in a substantially large size format.

3,723,000

AUTOMATIC EXPOSURE CONTROL FOR CONTACT EXPOSURE PHOTOCOPYING MACHINE

Hitoshi Sone, Kita Chigasaki, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Continuation-in-part of Ser. No. 689,870, Dec. 12, 1967, abandoned. This application Aug. 10, 1970, Ser. No. 62,558
Claims priority, application Japan, Dec. 15, 1966, 41/82476
Int. Cl. G03b 27/78
U.S. Cl. 355—83 7 Claims



An automatic exposure control for a contact exposure type photocopying machine wherein the exposure time is controlled automatically in response to the light penetrating coefficient or transmittance of the original form. The light penetrating coefficient is electrically detected and automatically set in a digital counter with the counter contents being converted into an analog exposure control signal for utilization by an exposure-time control device in the machine. Upon completion of one complete exposure, the counter is automatically reset in preparation for receiving the next original and repeating the automatic control cycle.

3,723,001

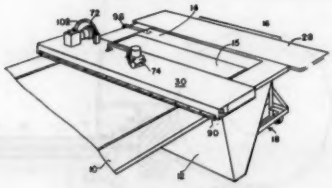
PHOTOGRAPHIC EXPOSURE APPARATUS

Bartheld Zeunen, Clarkston; Rex C. Grace, Troy, and Alvie R. Dunn, Madison Heights, all of Mich., assignors to Capitol Reproductions, Inc., Madison Heights, Mich.

Filed Sept. 3, 1970, Ser. No. 69,404
Int. Cl. G03b 27/10
U.S. Cl. 355—84 6 Claims

A portable photographic exposure apparatus for making reproductions of loft drawings, body drafts or the like directly from the drawing table on which the drawing is made. A wheeled cabinet structure has a horizontal supporting surface,

the height of which is adjustable to the height of a drawing table, with an exposure unit adapted to be mounted on the supporting surface and containing a light source, a set of electric motor driven wheels, and a source of static electricity. The exposure unit is driven over the drawing table to expose a sheet of film which is laid over the drawing on the drawing table to



reproduce the drawing. Static electricity projected by the exposure unit presses the film firmly against the drawing to be reproduced. The electric motor is reversible to return the exposure unit to its supporting cabinet. The apparatus may also be used to expose a negative which is subsequently processed to provide positive reproductions of the loft drawing.

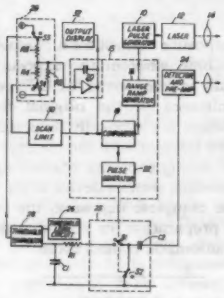
ERRATUM

For Class 355—83 see:
Patent No. 3,722,980

3,723,002
RANGEFINDERS

Frank G. Everest, Stevenage, and Raymond L. Albery, Bigleswade, both of England, assignors to British Aircraft Corporation, Limited, London, England

Filed Dec. 7, 1971, Ser. No. 205,596
Claims priority, application Great Britain, Dec. 10, 1970, 58,747/70
Int. Cl. G01c *3/08*
U.S. Cl. 356—5 **6 Claims**

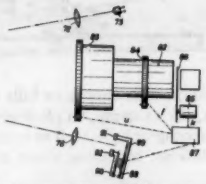


In a laser rangefinder a gating pulse is generated after each laser pulse emission and the time-positions of successive gating pulses in the intervals between laser pulses are progressively shifted and correspond to progressively changing ranges for reflected light pulses. When a signal corresponding to a reflected light pulse falls within the gating pulse period, the gated output is integrated and when the integrated value exceeds a threshold value the progressive alteration of the time positions of the gating pulses is halted.

3,723,003
RANGEFINDER

Karl Vockenhuber, and Eduard Keznicki, both of Vienna, Austria, assignors to Raimund Hauser, Vienna, Austria, by said Keznicki

Filed Nov. 18, 1969, Ser. No. 877,738
Claims priority, application Austria, Nov. 25, 1968, A 11 452
Int. Cl. G01c *3/08*
U.S. Cl. 356—4 **13 Claims**

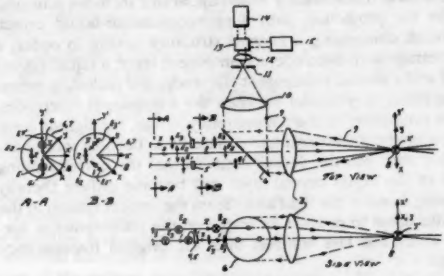


A rangefinding assembly, which comprises a transmitter having emitting means for emitting short waves. A receiver is mounted in fixed relation with respect to the transmitter, which receiver is adapted to receive short waves emitted by the transmitter and reflected by an object. An image forming system is adapted to project the waves reflected from the object on the receiver. The image forming system defines an axis. The axis, the transmitter and the receiver define a plane adapted to pass through the object. The receiver has at least two receiving zones. At least a part of the receiving zones is disposed in the plane and is at least partly offset from the axis, whereby each receiving zone is assigned to a different distance range of the object and delivers a specific output signal, when admitted by the short waves reflected from the object. Transducing means are arranged within at least a part of the receiving zones and are adapted to produce specific output signals in response to the short waves.

3,723,004
LASER VELOCIMETER EMPLOYING DUAL SCATTER DETECTION

Donald B. Brayton, Tullahoma, Tenn., assignor to the United States of America as represented by the Secretary of the Air Force

Filed May 18, 1971, Ser. No. 144,515
Int. Cl. G01p *3/36*
U.S. Cl. 356—28 **3 Claims**



A doppler shift laser velocimeter is disclosed that employs a self-aligning optical system capable of determining one or more velocity components of a moving substance. The beam from a plane polarized laser source is automatically split into two or more plane polarized parallel path beams by one or more parallel surface glass blocks. Certain ones of these beams are then polarization plane rotated and all beams are directed onto a focusing element which automatically focuses them to a common point P in space. Velocity components of a moving substance are detected by photo-detecting radiations simultaneously scattered from the moving substance and from

the polarization rotated illuminating beams. Means are connected to the outputs of the photodetectors for determining the frequencies of the electrical signals. These frequencies are proportioned to specific velocity components of the moving substance.

3,723,005

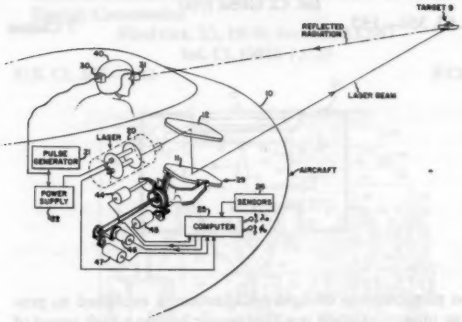
WIDE ANGLE SIGHTING APPARATUS

Gene K. Smith, Vestal, and Gene Tye, Endwell, both of N.Y., assignors to General Electric Co.

Filed Dec. 13, 1965, Ser. No. 513,394

Int. Cl. F41g 3/24

U.S. Cl. 356—29 **4 Claims**



An airborne air-to-ground "wide angle" sighting device which avoids optical aberrations inherent in aligning sights and target with vision through transparencies which are not optically inert or caused by faulty alignment of eye and sight. Narrow beam light, preferably monochromatic, e.g. a laser, is projected from aircraft onto ground and pilot viewing illuminated spot through viewer which enhances spot against varied background uses spot as sight. Device includes means for orienting fixed or moving beam in predetermined relationship to aircraft or armament to allow for various parameters such as altitude, speed, trajectories, etc.

3,723,006

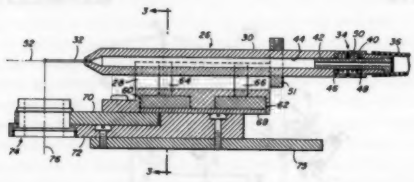
METHOD AND APPARATUS FOR SELECTING AND HANDLING PARTICULATE SPECIMENS USING A VACCUM PROBE

Roy L. Thomas, Jr., Medway, Mass., assignor to Charles Supper Company, Natick, Mass.

Filed May 7, 1971, Ser. No. 141,178

Int. Cl. G01n 23/20

U.S. Cl. 356—30 **16 Claims**



This disclosure depicts methods and apparatus for selecting, holding, and manipulating particulate specimens, and for assisting in observing, positioning, and mounting such specimens for analysis. In each embodiment illustrated a hollow vacuum probe is supported for rotation and translation in a V-block. In one embodiment the probe is retained on the block by magnetic forces, and in another embodiment by mechanical forces. A method is disclosed for mounting particulate specimens on a goniometer head for study by X-ray diffraction methods.

3,723,007

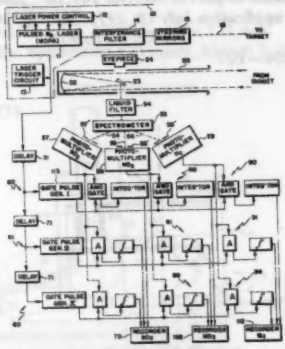
REMOTE QUANTITATIVE ANALYSIS OF MATERIALS

Donald A. Leonard, Stoneham, Mass., assignor to Avco Corporation, Cincinnati, Ohio

Filed Jan. 22, 1971, Ser. No. 108,710

Int. Cl. G01j 3/44

U.S. Cl. 356—75 **3 Claims**



The remote quantitative analysis of a material and the range of the material are determined from the Raman scattered radiation from the material, such as for example, a gas where the gas is subjected to intense pulses of laser radiation launched from a remote location. The scattered radiation is filtered to selectively attenuate reflected radiation from the source and transmit the Raman scattered radiation to a detector system which integrates the detected radiation over an interval spaced in time from a laser pulse whereby the spacing represents range to the gas and the integral represents the concentration of a particular species in the gas.

3,723,008

DIFFERENTIAL SPECTROPHOTOMETER

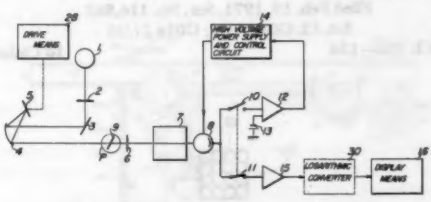
Kenji Fukuda, and Tadashi Honkawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 23, 1971, Ser. No. 201,454

Claims priority, application Japan, Dec. 24, 1970, 45/102779

Int. Cl. G01j 3/02, 3/42

U.S. Cl. 356—88 **10 Claims**



A beam of light passes through a sample and the transmitted light beam is detected by a detector. The light beam to be detected by the detector is a monochromatic light beam obtained by a dispersing means and the wavelength of the monochromatic light beam is continuously varied by a wavelength scanner. A transparent plate is obliquely positioned in the path of the monochromatic light beam so that the detector delivers an electrical signal representative of the absorption when the transparent plate lies in the path of the light beam and another electrical signal representative of the ab-

sorption when the transparent plate does not lie in the path of the light beam. A ratio detector or a difference detector compares these electrical signals with each other or subtracts one of these electrical signals from the other thereby obtaining a differential spectrum.

3,723,009

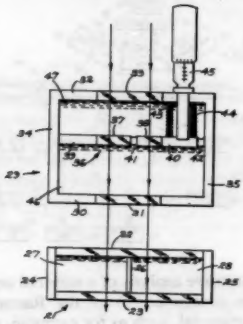
DIRECT READING ABERRATION-FREE COMPENSATOR WITH ADJUSTABLE SENSITIVITY FOR USE IN WHITE LIGHT INTERFEROMETRY

John B. Clark, 3203 Runkle St., Niles, Mich.

Continuation-in-part of Ser. No. 109,167, Jan. 25, 1971. This application July 19, 1971, Ser. No. 163,862

Int. Cl. G01b *9/02*

U.S. Cl. 356—107 **5 Claims**



An aberration-free compensator for use in white light interferometry is provided in which anomalous fringe shifts characteristic of the difference in refractive dispersion between the two limbs of the interferometer are eliminated. The compensator is designed so that the sole difference in light paths through the compensator elements in the two limbs of the interferometer is through fluid media having refractive dispersions which are substantially identical to that of the material being studied in the interferometer. Use of such a fluid medium compensator permits changing the refractive dispersion thereof without substantially rebuilding the interferometer.

3,723,010

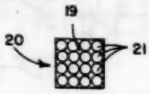
HOLOGRAPHIC METHOD AND APPARATUS FOR CHECKING THE OPTICAL CHARACTERISTICS OF TRANSPARENT MEMBERS

John T. McCrickered, Hawthorne, and Milton M. T. Chang, Gardena, both of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 19, 1971, Ser. No. 116,862

Int. Cl. G04b *9/00*; **G01n** *21/16*

U.S. Cl. 356—124 **10 Claims**



Coherent light as may be generated by a laser is passed through pattern forming means to generate a predetermined light pattern. This pattern of light passes through a standard or reference transparent member to a photosensitive plate on which a hologram of the image as optically affected by the transparent member is produced. Coherent light is then passed through a similar transparent member to be tested, the light pattern for the second member preferably differing from that for the first so as to facilitate a qualitative comparison between the two. The two patterns are compared for alignment with each other and a photographic record made which is capable of indicating the results of this comparison, the optical characteristics of the transparent member under test as compared with those of the reference member being determined from the degree of misalignment between the two patterns.

3,723,011

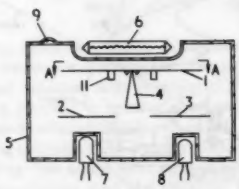
ANGLE SENSOR AND A STEERING SYSTEM BASED THEREON

Brian Allen Flory, and Roger Michael Geldard, both of Kent, England, assignors to Sharp and Company Limited, Kent, England

Filed Oct. 1, 1969, Ser. No. 862,737

Int. Cl. G05d *1/00*

U.S. Cl. 356—152 **7 Claims**



The phenomenon of light polarization is exploited to provide an improved angle position sensor having a high speed of response, negligible wear, and high resolution. The sensor has first and second parts movable relative to each other and incorporates a light source, a photosensitive element such as a photocell, and polarizing means disposed in the path of light passing from the light source to the photosensitive element, the signal from the photosensitive element giving a measure of the angle of rotation between the parts. Means for imparting a saturation-type response may be used in conjunction with the sensor with a view to avoiding problems connected with possible ambiguity of angle quadrant. The sensor lends itself to control applications and navigational devices.

3,723,012

HOLOGRAPHIC ALIGNMENT SYSTEM

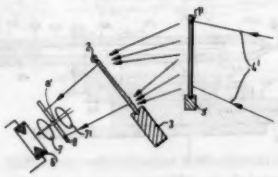
Eckhard Storck, Munich, and Joachim Ost, Martinsried, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed April 5, 1971, Ser. No. 130,971

Claims priority, application Germany, April 8, 1970, P 20 16 815.4

Int. Cl. G01b *11/26*

U.S. Cl. 356—152 **10 Claims**



A method and apparatus for repositioning a body such as a diffuser body, hologram film or a body rigidly attached thereto in a previous position in a system characterized by making or exposing a hologram by use of reference wave and a wave coming from an object with each wave being of coherent radiation with a diffuser interposed in the path of one of the waves. The exposed hologram film is developed and repositioned in the system. Then either a wave from the object or the

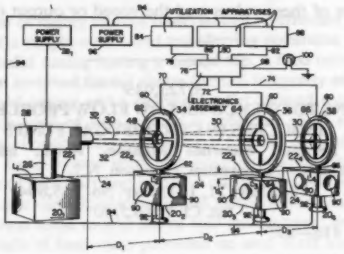
reference wave is projected on the hologram to reconstruct the other wave and the diffuser is located in the path of the same one wave to produce direct and diffused radiation. The intensity of the direct radiation of the reconstructed wave is measured to obtain a maximum measurement for the intensity of the direct radiation which will occur when the body is in the previously selected position. The body may be the diffuser and have a surface which will diffusely disperse the wave into direct and diffused radiation.

3,723,013

ALIGNMENT SYSTEM

Meade A. Stirland, Los Alamos, N. Mex., and John A. Kalinowski, San Ramon, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 23, 1970, Ser. No. 83,567
Int. Cl. G01b *11/26*
U.S. Cl. 356—152 **8 Claims**



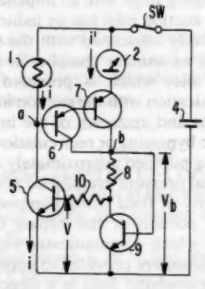
This alignment system utilizes intermediate photodetectors having central apertures and a terminal photodetector, each photodetector having four quadrants of active area, with their centers aligned on the axis of a laser beam, their output signals being utilized to indicate alignment, or the degree of misalignment, of their centers with respect to the axis of the laser beam. Alternatively their output signals are utilized to drive servo systems that automatically move the quipments on which they are mounted into alignment, Means for providing orthogonal alignment, and means to avoid air turbulence are also provided.

3,723,014

PHOTOELECTRIC LIGHT MEASURING DEVICE

Yasuhiro Nanba, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka Prefecture, Japan

Filed April 13, 1971, Ser. No. 133,495
Claims priority, application Japan, April 13, 1970, 45/31407; Aug. 29, 1970, 45/86037; Aug. 29, 1970, 45/86038
Int. Cl. G01j *1/44;* **H01j** *39/12*
U.S. Cl. 356—226 **9 Claims**



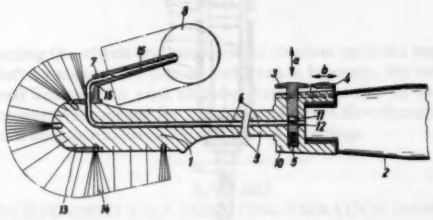
In a photoelectric light measuring device, a photoelectric transducer, such as photoconductive cell, is connected in series with a transistor, so that the logarithm of incident light on the cell can be graduated uniformly on an ordinary ammeter having a linear current-deflection characteristic, thereby enabling easy reading and affording a simple mechanism in a photometer or an automatic shutter speed control system, without adverse temperature dependency of the indication.

3,723,015

BRUSH

Bernhard Wissler, and Erich Dietsche, both of Black Forest, Germany, assignors to Firma Roman Dietsche, Aftersteg/Black Forest, Germany

Filed March 5, 1971, Ser. No. 121,441
Claims priority, application Germany, March 7, 1970, P 20 10 852.5
Int. Cl. B43k *11/10*
U.S. Cl. 401—278 **12 Claims**



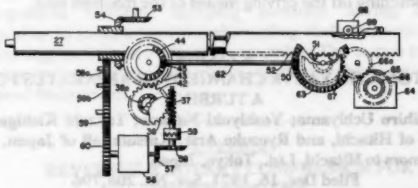
A toilet brush, which may be advantageously equipped with a rinsing brush as well as a brush head on a brush handle, in which a container for cleaner or disinfectant is detachably mounted on the end of the brush handle, and the container is connected to the bristle head by a tube that can be closed off by a valve.

3,723,016

SPINDLE DEPTH CONTROL

Robert A. Lehmkuhl, Cincinnati, Ohio, assignor to The Carlton Machine Tool Company, Cincinnati, Ohio

Filed Feb. 17, 1971, Ser. No. 116,154
Int. Cl. B23b *47/18*
U.S. Cl. 408—3 **2 Claims**

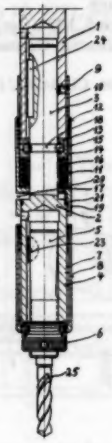


A horizontal boring machine of the type having a traversing spindle and utilizing fluid motor means for driving the spindle with a tool to a cutting position then moving the tool into the workpiece to a preselected depth with electrical means actuated when said preset depth has been reached to cause a change in the flow of oil in the fluid motor to retract the spindle.

3,723,017
DRILLING CHUCK

Otto Bilz, Esslingen, and Otto Fauth, Nellingen, both of Germany, assignors to Firma Otto Bilz, Nellingen, Germany

Filed Aug. 23, 1971, Ser. No. 174,050
Claims priority, application Germany, Sept. 5, 1970, P 20 44 137.6; Jan. 15, 1971, P 21 01 704.9
Int. Cl. B23b *49/00*
U.S. Cl. 408—16 16 Claims



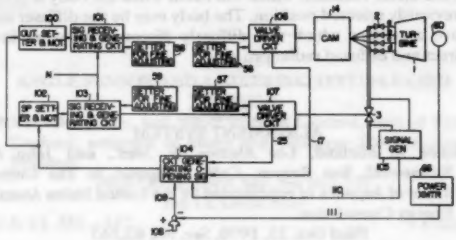
A chuck unit for a boring or similar tool which is provided with a safety clutch comprising an additional tool spindle which is axially slidable partly within and relative to the machine spindle and carries the boring tool, and clutch balls which normally engage into an annular clutch groove in the tool spindle under the action of an adjustable compression spring which is interposed between and connects the tool spindle to the machine spindle. If because of a dull boring tool the axial back pressure by the workpiece upon the tool exceeds the strength at which the clutch balls are maintained by the preadjusted compression spring in the clutch groove of the tool spindle, the latter shifts toward the rear relative to the machine spindle and thereby forces the clutch balls out of the clutch groove so that the further forward movement of the machine spindle will not be transmitted to the tool spindle and the boring tool thereon. The disengagement of the safety clutch may be visually indicated either directly on the clutch unit or at a remote point and the indication may also be used for switching off the driving means of the machine tool.

3,723,018
AUTOMATIC VALVE CHANGEOVER APPARATUS FOR A TURBINE

Yoshihiro Uchiyama; Yoshiyuki Nakano; Takashi Kishigami, all of Hitachi, and Ryosuke Arie, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 16, 1971, Ser. No. 208,796
Claims priority, application Japan, Dec. 16, 1970, 45/111750
Int. Cl. F01b *25/06*
U.S. Cl. 415—30 15 Claims

An automatic valve changeover apparatus for controlling the admission of steam to a turbine. During the starting-up operation of a turbine, the admission of steam is shifted from "full arc admission" to "partial arc admission" in accordance with electrical output signals from an output setter and a speed setter. The output signals of the output setter and the speed setter respectively control the opening of control valves and a steam stop valve in accordance with the detected open

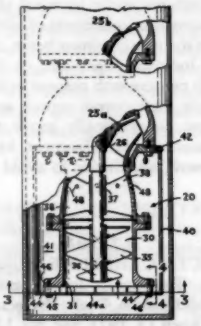


positions of these valves and the speed or output of the turbine.

3,723,019
MEANS TO OVERCOME LOW FLOW PROBLEMS OF INDUCERS IN CENTRIFUGAL PUMPS

Merril Berman, Shawnee Mission, Kans., assignor to Worthington Corporation, Harrison, N.J.

Filed May 21, 1971, Ser. No. 145,804
Int. Cl. F04d *5/00*
U.S. Cl. 415—53 5 Claims

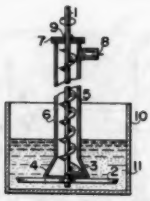


A centrifugal pump having a suction inlet, a discharge outlet and at least one pumping stage with an impeller in direct communication with the suction inlet has an inducer means in the suction inlet operatively associated with the impeller of said pumping system and an annular chamber or passage formed about the suction inlet which is provided with ports or openings in communication with the suction inlet downstream of the inducer means and upstream of the inducer means to permit the automatic bypassing or recirculation of a given portion of the fluid being pumped approximately as a direct function of the differential pressure established across the inducer means by the quantity of fluid being pumped. Angled guide vane means in the portion of the bypass or recirculation chamber or passage which communicates with the upstream side of the inducer means are provided to impart prerotational movement in the recirculated fluid in a direction of rotation the same as that of the inducer means the bypass means and guide vane means acting to maintain a reduced head across the inducer particularly at low or partial flow conditions.

3,723,020
APPARATUS FOR TRANSFERRING HIGHLY VISCOUS MATERIAL

Makoto Watanabe, 1070-4, Oaza-Shiba, Kawaguchi, Saitama, Japan

Filed March 17, 1971, Ser. No. 125,199
Int. Cl. F01d 5/00
U.S. Cl. 415—72 1 Claim

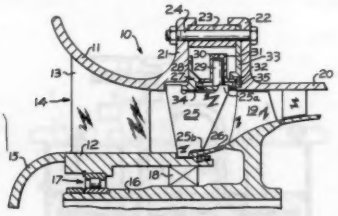


Transfer of highly viscous material can be effected easily by the use of a simple-structured transferring apparatus comprising: a tubular casing having a closed top, a feed introduction port of an inverted funnel shape formed integrally at the bottom of said casing and a delivery outlet formed through the upper side wall of said casing; a rotatable shaft extending through said casing beyond both ends thereof; at least one raking vane fixed to said shaft at a position slightly beyond the end edge of said port and having a curved and twisted face; a helical guide vane fixed to said shaft in said funnel-shaped port at a position close to and above said raking vane; and a continuous helical feed vane provided on said shaft and joining said guide vane and extending along the shaft in said casing up to a position close to said closed top.

3,723,021
FLEXIBLE AIRFOIL FOR COMPRESSOR

Paul E. Bartholomew, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 28, 1971, Ser. No. 110,461
Int. Cl. F01d 24/02, 17/12
U.S. Cl. 415—147 2 Claims



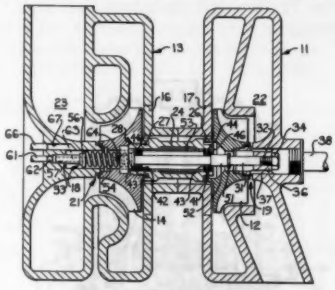
The inlet guide vanes for a turbine compressor are constructed of thin flexible material and mounted in a manner to be selectably formed into a desirable airfoil shape and camber angle by suitable control means.

3,723,022
BEARING SUPPORTED COUPLING FOR TURBOCHARGERS

George E. Olson, Lacon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed March 1, 1971, Ser. No. 122,597
Int. Cl. F01d 5/08; F04b 17/00; F01m 11/00
U.S. Cl. 415—175 4 Claims

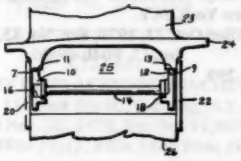
A bearing supported coupling arrangement between a turbine wheel and compressor wheel arranged in axially aligned housings of a turbocharger with the two wheels and housings forming an axial chamber, the coupling including a support shaft secured at one end to one of the housings and supported at its other end by the other housing, a tubular shaft interconnecting the wheels and arranged for rotation upon the support shaft by means of a pair of anti-friction bearings, the tubular shaft isolating the axial chamber from the interior of the two housings with means for providing lubricant flow through the axial chamber to lubricate and cool the bearings.



3,723,023
INDEPENDENT SELF ADJUSTING VIBRATION DAMPER

Virlon Crick, Southwick, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed May 5, 1971, Ser. No. 140,401
Int. Cl. F01d 5/16
U.S. Cl. 416—219 1 Claim



The torque-transmitting connections between a turbine rotor and the individual turbine blades include centrifugally responsive vibration damping elements having limited freedom to swing an individual coupling shafts between plates securing each blade to the rotor assembly. The torque transfer value varies as the speed varies, to damp vibrations due to speed fluctuations.

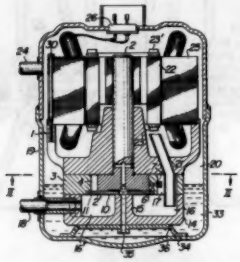
3,723,024
REVERSIBLE ROTARY COMPRESSOR FOR REFRIGERATORS

Satoshi Sawai, Kawachinagano; Jusaburo Maekawa, Tondabayashi, and Yoshimi Tanaka, Sakai, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Dec. 29, 1970, Ser. No. 102,383
Claims priority, application Japan, Dec. 30, 1969, 44/293
Int. Cl. F01c 21/12; F04c 15/02, 29/08
U.S. Cl. 418—159 11 Claims

A reversible rotary compressor for use in refrigerators, in which a suction mechanism and a discharge mechanism are

provided in a rotary member which is rotated in the same direction by a rotor of the compressor in frictional engagement therewith, and sucking and discharging operations of said mechanisms are automatically switched by changing the direction of rotation of said rotor; and which, therefore, is completely free of back flow of gas, is operable with minimum power consumption, has a constant compressing ability in both the counterclockwise rotation and the clockwise rotation



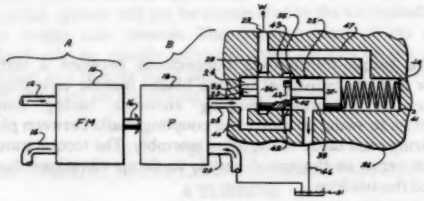
of the rotor, has a minimum number of suction ports and hence a minimum top clearance volume, and is high in compressing efficiency. By employing the compressor in heat pump-type air conditionars, there can be obtained such an advantage that the operation of the air conditioner can be switched from cooling operation to heating operation or vice versa, only by changing the direction of rotation of the compressor rotor without using a directional control valve in a refrigerant circuit, which has been indispensable heretofore.

3,723,025

VARIABLE BYPASS FOR FLUID POWER TRANSFER SYSTEMS

James L. Coakley, Camarillo, Calif., assignor to Abex Corporation, New York, N.Y.

Filed Oct. 23, 1970, Ser. No. 83,330
Int. Cl. F04b *49/00*
U.S. Cl. 417—299 **6 Claims**



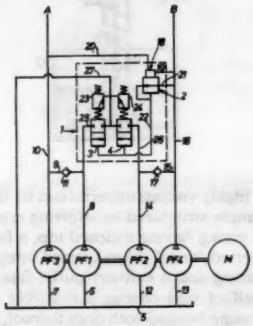
Apparatus for variably dividing the output flow of a pump between a work system and a bypass system, in accordance with the flow demanded by the work system. The apparatus includes a metering valve which is progressively opened as the demand for work flow increases, to permit pump output to flow to the work system. The apparatus also includes a bypass valve which regulates flow to a bypass system, and which is progressively closed as the metering valve opens, so that total pump output is distributed as needed between the work and bypass system.

3,723,026

EFFECT REGULATOR FOR CONSTANT AND VARIABLE VOLUME-FLOW PUMPS

Ingebret Soyland, and Kristian Soyland, both of 4340 Bryne, Norway

Filed April 9, 1971, Ser. No. 132,668
Claims priority, application Norway, April 22, 1970, 1551
Int. Cl. F04b *49/00*
U.S. Cl. 417—286 **5 Claims**



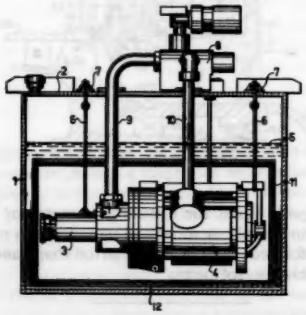
Means for regulating the flow of fluid from two or more pumps in a hydraulic system, according to the instantaneous demand for energy.

3,723,027

PUMPING UNITS

Torsten Montelius, Djursholm, Sweden, assignor to Aktiebolaget Imo-Industri, Stockholm, Sweden

Continuation of Ser. No. 883,559, Dec. 9, 1969, abandoned. This application Aug. 26, 1971, Ser. No. 175,357
Claims priority, application Sweden, Dec. 13, 1968, 17112/68
Int. Cl. H02k *5/10*; F04b *1/99, 21/00*
U.S. Cl. 417—313 **1 Claim**

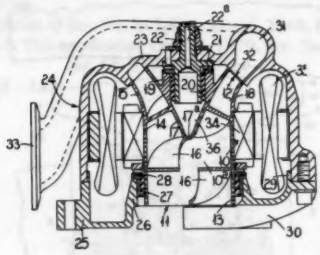


Sound generated by a submerged motor-pump unit and transmitted through the liquid in which the unit is submerged is attenuated by shielding means comprising a first box-like member having a downwardly facing opening and a second box-like member having an upwardly facing opening and overlapping the first box-like member. The box-like members are made from sheet metal coated with foam rubber or other sound-absorbing material.

3,723,028
ELECTRICALLY DRIVEN PUMP

Harry Simister Bottoms, and Geoffrey Arthur Lewis, both of Solihull, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed May 6, 1970, Ser. No. 35,200
Int. Cl. F04b *17/00*
U.S. Cl. 417—356 6 Claims

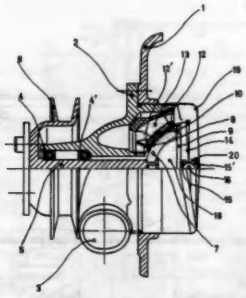


A pump for liquids has a rotor and a casing which also form part of an induction motor. The rotor has internal helical vanes and includes a conical portion at its downstream end to provide an annular outlet. There are aligned axial through passages in the rotor and casing. The annular rotor outlet is aligned with a volute chamber which communicates with the pump outlet. When pumping the rotor also operates to separate, by centrifugal action, the liquid from any vapor present, the vapor passing out of the pump via the axial passages.

3,723,029
COOLING WATER PUMP FOR AUTOMOBILES

Nikolaus Laing, 7141 Aldingen near Stuttgart, Hofener, Germany

Filed March 15, 1971, Ser. No. 124,211
Claims priority, application Austria, March 17, 1970, 2458
Int. Cl. F04b *17/00*
U.S. Cl. 417—420 6 Claims

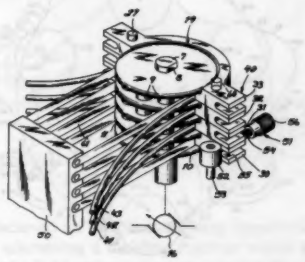


A coolant pump for liquid cooled engines where the pump casing has a chamber, a rotatable drive shaft in the pump casing, a first pole ring on the drive shaft and a second pole ring rotatably mounted in the pump chamber which has impeller blades thereon and means for hermatically sealing the pump chamber from the drive shaft and first pole ring. Means may also be included for varying the slippage between the first and second pole rings in order to vary pump output.

3,723,030
PERISTALTIC PUMP WITH STACKED COMPONENTS

Daniel Gelfand, Brooklyn, N.Y., assignor to Buchler Instruments Division, Nuclear-Chicago Corporation, Fort Lee, N.J.

Filed March 3, 1971, Ser. No. 120,644
Int. Cl. F04b *43/08, 43/12, 45/06*
U.S. Cl. 417—475 12 Claims



The roller member and/or the arcuate support member for the tubes of a peristaltic pump are stacked to accommodate a number of tubes. The rotor is stacked from disks having rollers along one surface so that the disks may be assembled in back-to-back relationship to accommodate large-diameter flexible tubing or in a series relationship to accommodate tubing of smaller diameter. The support is similarly made up of flanged members which may be stacked back to back or in series (face-to-back).

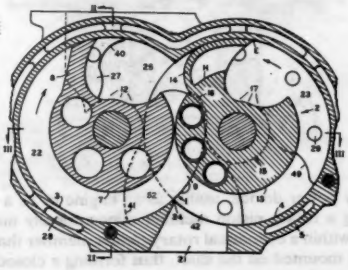
ERRATUM

For Class 418—159 see:
Patent No. 3,723,024

3,723,031
ROTARY DISPLACEMENT MACHINES

Arthur E. Brown, 117 East 5th St., Corning, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,987
Int. Cl. F01c *21/12*; F03c *3/00*; F04c *29/08*
U.S. Cl. 418—15 23 Claims



A rotary compressor, vacuum pump, or expansion engine. Two interengaging rotors rotate within bores in a casing structure. Each rotor has a hub and a tooth. Plates are located against the four inside end walls of the two casing bores. The four plates are angularly adjustable so as to vary both the capacity and the internal pressure ratio. The machine has zero (or near zero) clearance volume so that (when operating as a

compressor) substantially all of the compressed gas is delivered to the discharge ports.

3,723,032

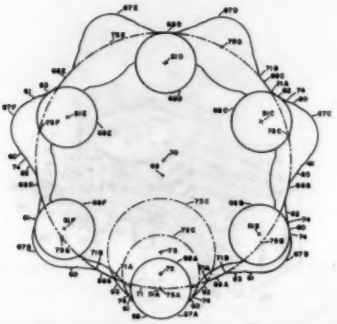
ANTI-FRICTION ORBITAL AND ROTARY DEVICE

George V. Woodling, 22077 West Lake Rd., Rocky River, Ohio

Filed April 5, 1971, Ser. No. 131,130

Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*

U.S. Cl. 418—61 17 Claims



Orbital and rotary device including outer and inner relatively movable body means having a combined relative movement therebetween comprising a relative orbital movement and a relative rotational movement, wherein said inner body means has anti-friction bearing means for making engagement with the internal surface of said outer body means, and wherein all of the contactable wall portions between the inner and outer body means point outwardly in the same direction.

3,723,033

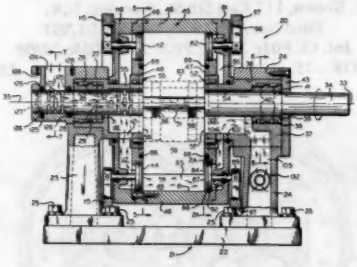
ROTARY POWER DEVICE

Henry Tauscher, Oak Park, Ill., assignor to Impact, Inc., Chicago, Ill.

Filed July 14, 1971, Ser. No. 162,421

Int. Cl. F03c *3/00*; F04c *17/00*

U.S. Cl. 418—173 10 Claims



A rotary power device, usable as an engine or as a pump, comprising a rotary piston member concentrically mounted on a shaft within a cylindrical rotary runner member that is eccentrically mounted on the shaft, thus forming a closed, ring-like chamber of varying depth between the piston member and the runner member. The shaft, the piston member and the runner member are keyed together for conjoint rotation. Sliding vanes or other gate members are mounted in the piston member and project outwardly into engagement with the runner member, dividing the chamber into a plurality of chamber segments that vary continuously in volume, between maximum and minimum values, as the piston member and the runner member rotate.

3,723,034

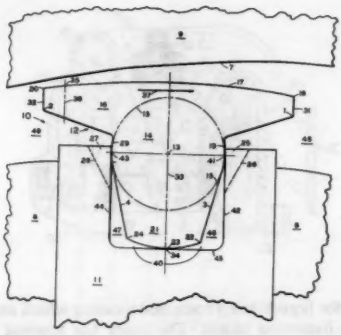
VANE END AND TIP ASSEMBLY

Harry T. Johnson, Westerville, and Robert K. Mitchell, Hilliard, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Oct. 26, 1971, Ser. No. 192,180

Int. Cl. F04c *27/00*

U.S. Cl. 418—268 17 Claims



A pivoting vane tip in a sliding-vane rotary moving-fluid device. For increased load capacity the bearing pad is wider than the central cylindrical pivot portion. A moment compensator portion provides outwardly extending surfaces for counteracting, with the same pressures, the moments produced by differential pressures on leading and trailing surfaces of the bearing pad, to provide a net rotational moment of substantially zero and thus to maintain substantially the optimum angle between the bearing surface and the cam during rotation at high speed, to minimize friction and wear.

3,723,035

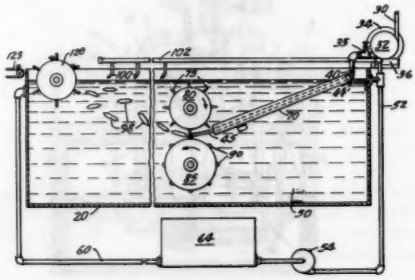
APPARATUS FOR FORMING HOT MELT ADHESIVES INTO A READILY PACKAGEABLE FORM

Willard A. Franke, St. Paul, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 824,244, May 13, 1969, abandoned. This application Oct. 29, 1970, Ser. No. 85,158

Int. Cl. B29c *25/00*; B29d *7/20*

U.S. Cl. 425—71 26 Claims



An improved method and apparatus for handling of materials having characteristics such that they are normally solid at room ambient temperatures and are prepared and used at elevated temperatures to transfer the form of the material to a liquid. The improved method and apparatus provides for handling of the material in liquid form and extruding it as a stream or continuous flow, cooling the outer surface of the same to solidify it and severing the stream of material with the hardened exterior and liquid interior such that the individual segments severed therefrom seal themselves and form in-

dividual pillow-like segments which can be then further cooled to a hardened state and readily handled, packaged, shipped and used.

3,723,036

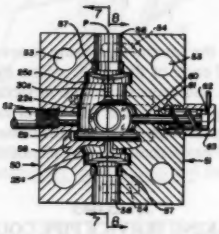
MOLD FOR THE MANUFACTURE OF A PLASTIC ROPE CONNECTOR

John Maguire; Jonathan E. Sharp, and Richard H. Frost, all of Littleton, Colo., assignors to Rose Manufacturing Company, Denver, Colo.

Continuation of Ser. No. 847,884, Aug. 6, 1969, Pat. No. 3,591,215. This application Oct. 21, 1970, Ser. No. 82,693

Int. Cl. B29f 1/10, 1/14

U.S. Cl. 425—129 **6 Claims**



This disclosure concerns a method for forming a plastic, button-like connector for securing a pair of crossed ropes together and also a mold for effecting the operation. The injection molding operation includes the step of holding the ropes in position in the mold cavity while the plastic is being injected thereinto and also a restricted opening where the ropes extend from the cavity to prevent loss of plastic during the injection operation.

3,723,037

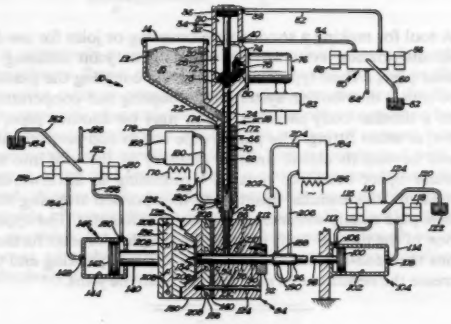
APPARATUS FOR INJECTION MOLDING ARTICLES FROM AMINOPLASTIC MATERIAL

Jerome L. Formo, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.

Filed Nov. 4, 1970, Ser. No. 86,726

Int. Cl. B29f 1/14

U.S. Cl. 425—139 **3 Claims**



Apparatus performing according to the method for injection molding aminoplastic articles having large, flat, and smooth finished areas is disclosed. In the preferred embodiment shown, the aminoplastic material is metered from a hopper into a transfer cylinder while being maintained at a uniform temperature sufficient to soften it. A plunger in the transfer cylinder then pushes the softened aminoplastic material directly into the mold cavity of a two-part mold in a manner to maintain substantially the same passage area from the transfer cylinder to and into the mold cavity. The plastic is cured by the application of a second uniform and higher temperature, and the finished article is discharged. Two methods allowed by the present invention of discharging articles from the mold, by plunger movement and by air pressure, are also disclosed.

3,723,038

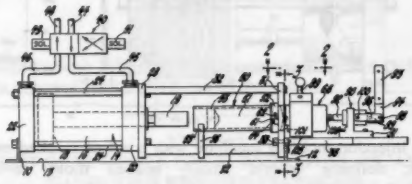
INJECTION MOLDING APPARATUS

Harry H. Little, 202 Cedar Lane, Vienna, Va.

Filed Sept. 16, 1970, Ser. No. 72,588

Int. Cl. B29f 1/00

U.S. Cl. 425—192 **1 Claim**



There is disclosed an injection molding apparatus having a cartridge for containing a molding material which is injected by operation of a fluid pressure operated motor through a nozzle into a multipart mold whose parts are clamped together by the camming action of a clamp. The mold has an injection port receiving the cartridge's nozzle to provide for injection of the molding material into the mold. The nozzle and port also cooperate to support the mold relative to the cartridge. A second clamp is provided to clamp the mold to the cartridge during the injection operation.

3,723,039

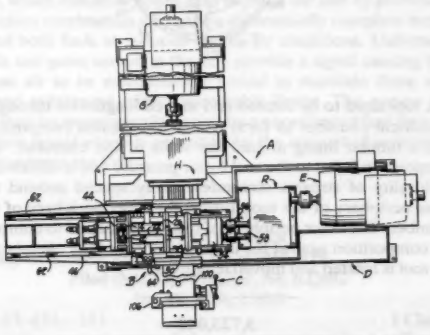
INTERNAL MIXER

James T. Matsuoka, Brecksville, and Armindo Cantarutti, Akron, both of Ohio, assignors to Intercole Automation, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 841,349, July 14, 1969. This application Jan. 4, 1971, Ser. No. 103,537

Int. Cl. B29b 1/10

U.S. Cl. 425—204 **2 Claims**



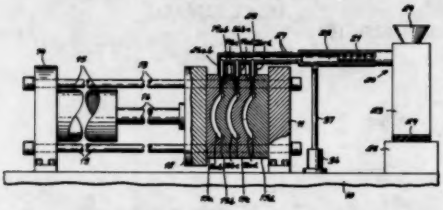
An internal continuous mixer with parallel mixing rotors and a screw controlled discharge. Each rotor comprises a central bladed mixing portion, a screw infeed portion and a screw outfeed portion. The threads of the screw outfeed portion have nonuniform crest diameter thus working the material being mixed, and providing clearance permitting the material discharge rate to be controlled down stream therefrom as by an enclosed material conveyor or feed screw, preferably a screw extruder apparatus.

3,723,040

INJECTION-MOLDING MACHINE WITH TRANSVERSE FEED

Herbert Rees, Toronto, Ontario, Canada, assignor to Husky Manufacturing & Tool Works Limited, Toronto, Ontario, Canada

Division of Ser. No. 16,442, March 4, 1970, Pat. No. 3,659,997. This application Jan. 17, 1972, Ser. No. 218,625
Int. Cl. B29f 1/03
U.S. Cl. 425—245 4 Claims



An injection-molding machine with a set of stacked mold plates, defining several axially spaced mold cavities therebetween, includes an injection unit with one or more nozzles movable perpendicularly to the stack for contact with respective inlets, leading to the several cavities, which are aligned with these nozzles in the closed position of the multiple mold. The mold plates may be interconnected by a lazytong linkage or by lost-motion couplings for proper relative spacing in the open mold position.

3,723,041

TOOL FOR FORMING ASBESTOS LININGS AND THE LIKE

Lester F. Brown, Lubbock, Tex., assignor to Standard Concrete Pipe Company, Inc., Lubbock, Tex.

Filed Nov. 6, 1968, Ser. No. 773,858
Int. Cl. B28b 19/00
U.S. Cl. 425—262 23 Claims

A tool sized to be rotated and moved lengthwise through a cylindrical chamber to form a cement-asbestos composition into a tubular lining around the walls of the chamber. The composition is fed to the tool by air pressure and is directed in a plurality of streams circumferentially spaced around the outer periphery of the tool toward the inner periphery of the chamber. The outer periphery of the tool is shaped to compact the composition against the inner periphery of the chamber as the tool is rotated and moved lengthwise.

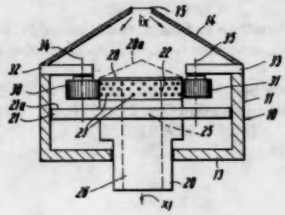
3,723,042

ANIMAL FOOD STUFF PRESS

Jost-Hinrich Raydt, Bei den Muhren 91, 2000 Hamburg 11, Germany

Filed Aug. 11, 1971, Ser. No. 170,946
Claims priority, application Germany, June 15, 1971, P 21 29 532.9
Int. Cl. B29h 3/012
U.S. Cl. 425—331 6 Claims

The press having within a cylindrical press housing a central power-driven barrel matrix and a plurality of mutually spaced press rollers engaging the outer periphery of the barrel matrix whereby the pivot axes of the barrel matrix and of the rollers are parallel to each other. Press feed may be introduced into the press through a feed hopper mounted on top of the press housing and having a central inlet connection. The press feed



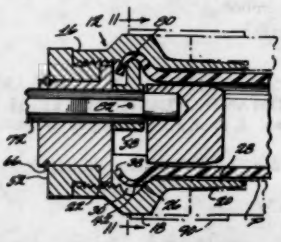
is guided towards the several squeezing zones defined between barrel matrix and each of the press rollers by means of arcuately shaped bars and arcuate pickup devices extending from the press housing wall towards the barrel matrix. The press feed, after passing through perforations in the periphery of the barrel matrix, will be discharged centrally of the barrel matrix.

3,723,043

TOOL FOR MAKING SERVICE PIPE COUPLING JOINT

Wilbur R. Leopold; Frank C. Hackman; Carl E. Floren, and Wallace E. Gould, all of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Division of Ser. No. 885,462, Dec. 16, 1969, Pat. No. 3,687,492. This application Oct. 29, 1971, Ser. No. 194,068
Int. Cl. B29c 17/02
U.S. Cl. 425—393 6 Claims



A tool for making a service pipe coupling or joint for use in fluid distribution systems, the coupling or joint utilizing a plastic pipe, a flare-type coupling nut for coupling the plastic pipe into a distribution system, the coupling nut cooperating with a tubular body member which may be another pipe, a valve, or other fitting. The plastic pipe has its end portion cold flared beyond its elastic limit or memory by the tool into an annular upset bead-like portion terminating in an inwardly turned lip, the annular upset bead-like portion trapping the plastic pipe axially with respect to the coupling nut. The application of the tubular body to form the coupling or joint further forms the bead-like flare to provide a seal and packing and to increase the resistance of pipe pullout from the joint.

3,723,044

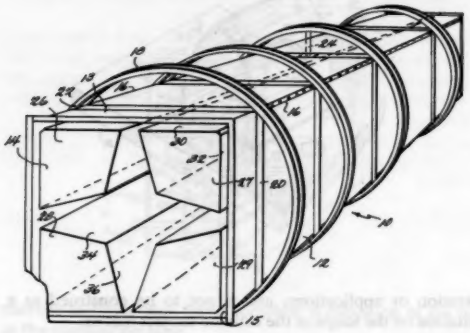
CENTRIFUGAL CASTING APPARATUS

R. B. Motheral, Rt. 4, Box 130, Georgetown, Tex.

Filed June 17, 1971, Ser. No. 154,151
Int. Cl. B28b 21/30
U.S. Cl. 425—435 10 Claims

A centrifugal casting apparatus is provided for casting concrete, flat surfaced articles such as hollow, square beams; a first mold surface having flat walls for forming the exterior surface of the beam is carried on a set of ring members evenly

spaced along the mold enclosure; core members are mounted within the flat walls and spaced therefrom for forming the interior surface of the beam; the core members are shaped and arranged with respect to one another to provide flow passages



for the casting material so that when the mold enclosure is rotated about its axis, casting material may be continuously supplied to the interior of the housing and fed to the forming surfaces.

3,723,045

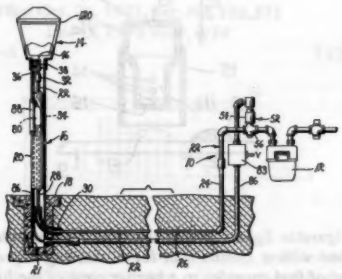
LIGHTING SYSTEM

James D. Reese, 11937 Avenue 274, Visalia, Calif.

Filed June 21, 1971, Ser. No. 155,140

Int. Cl. F23m *5/08*

U.S. Cl. 431—18 **4 Claims**



A selectively operable lighting system including a lamp for providing a flame of gas particularly suited for use in illuminating outdoor areas, such as patios, terraces and the like. The system is characterized by a tubular pillar supported by a rigid pedestal embedded beneath the surface of an area being illuminated, and surmounted by a burner connected with a source of gas and encased within a protective and ornamental head. A selectively operable, electrically energizable igniter capable of responding to an absence of an illuminating flame is provided for igniting combustible gas delivered to the burner, whereby a substantially continuous illuminating flame selectively is provided.

3,723,046

SIMULATED FIRE APPARATUS

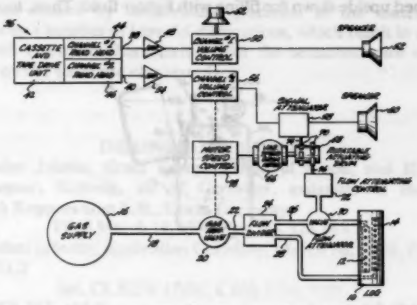
Dan W. Poling, P.O. Box 2006, Lincoln City, Oreg.; Edward E. Calkins, Box 137, Rose Lodge, Oreg., and Robert L. Fagaly, Dept. of Physics and Astronomy, University of Toledo, Toledo, Ohio

Filed Oct. 26, 1971, Ser. No. 192,114

Int. Cl. F23n

U.S. Cl. 431—18 **10 Claims**

Simulated fire apparatus wherein a gas or electrically operated flame portrayer is adjusted to vary the type of flame



portrayed. Such adjustments are coordinated with adjustments in sound effects produced by a speaker.

3,723,047

CONTROL NETWORK FOR BURNING FUEL OIL AND GASES WITH REDUCED EXCESS AIR

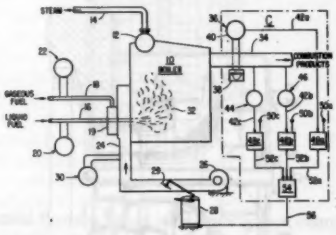
Guy M. Baudelet de Livois, Paris, France, assignor to Controle Bailey (Societe Anonyme), Clamart, France

Filed May 25, 1971, Ser. No. 146,669

Claims priority, application France, May 26, 1970, 7019186

Int. Cl. F23n *5/08*

U.S. Cl. 431—76 **12 Claims**



Control networks for combustion processes, utilizing liquid and gaseous fuels burned in either common or separate burners, which minimize heat losses through the flue by providing sufficient combustion air to allow substantially complete burning of both fuels at reduced excess air conditions. Unburned solids and gases sensed in the flue provide a signal causing the excess air to be automatically varied to maintain these unburned substances within acceptable limits. The excess air also may be automatically varied by a coordinated fuel flow to air flow signal which is corrected by the amount of unburned substances in the flue.

3,723,048

SAFETY LIGHTER

Barney G. Russell, P.O. Box 873, Camden, Ark.

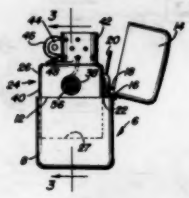
Filed Oct. 22, 1970, Ser. No. 82,982

Int. Cl. F23q *25/00*

U.S. Cl. 431—151 **1 Claim**

A safety-type cigarette lighter characterized by a self-contained removable tank unit and a protective jacket or casing for said unit. The casing, which is of a well known type, embodies a cup-type receiver whose upper open end is normally closed by a hinged cap-type cover retained by resilient latch means when in its closing position. The hollow tank of the tank unit is equipped with the usual flint, finger-turned sparking wheel and wick-equipped neck, and is wholly filled with a wad of absorbent fluid storing material. This unit does not have to be fully withdrawn to charge with lighter fluid. The

upper half-portion is withdrawn just enough to uncover and expose a filler hole. Therefore, the lighter does not have to be turned upside down for filling with lighter fluid. Then, too, the



disclosed lighter features a novelly arranged wick which has a coil aligned with and exposed for quick saturation during the fuel filling step.

3,723,049

RESONANCE CONTROL FOR A MUFFLE BURNER

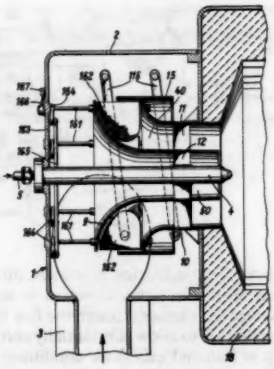
Edward L. Juricek, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 26, 1971, Ser. No. 146,978

Claims priority, application Switzerland, May 29, 1970, 8056/70

Int. Cl. F23m 9/00

U.S. Cl. 431—183 **6 Claims**



Vanes are provided in the inlet to the outer annular combustion air supply duct which are adjustable to change the direction of air flow by a magnitude of up to 10 percent in the tangential velocity component at the outlet of the outer duct. This avoids humming or whistling. The vanes are controlled in unison from a control lever outside the distribution box.

3,723,050

PILOT CLAMP AND SHIELD

Walter Chandler Stevens, Jr., Mansfield, Ohio, and Philip M. More, Chattanooga, Tenn., assignors to Universal Refrigeration, Inc., Mansfield, Ohio

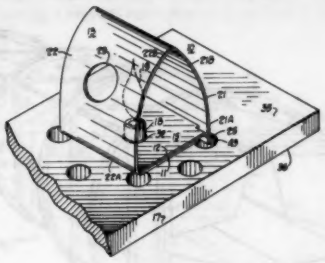
Filed Oct. 14, 1971, Ser. No. 189,088

Int. Cl. F24c 3/10

U.S. Cl. 431—191 **17 Claims**

A combined clamp and shield for a pilot burner is disclosed able to secure the pilot burner to a burner support and to shield a flame of the pilot burner from atmospheric disturbances and to shield adjacent structures from the flame and heat thereof. The combined clamp and shield can be incorporated into a unitary piece which is easy to manufacture.

The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of



operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,723,051

CIGARETTE LIGHTER USING MICROENCAPSULATED FUEL

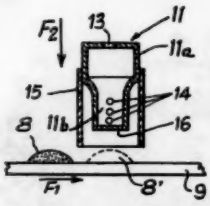
Daniel Bouvier, Paris, France, assignor to S. T. Dupont (Societe Anonyme), Paris, France

Filed Dec. 24, 1970, Ser. No. 101,288

Claims priority, application France, Dec. 24, 1969, 6944874

Int. Cl. F23q 1/02

U.S. Cl. 431—267 **12 Claims**



A cigarette lighter which uses microencapsulated fuel, is provided with a mechanism for advancing a predetermined amount of fuel capsules to a burner zone of the lighter from a reservoir thereof and a mechanism for crushing the fuel capsules in the burner zone to effect a release and permit a subsequent ignition of fuel.

3,723,052

LIQUID FUEL BURNER APPARATUS

Akihiko Nakashima, Neyagawa; Mituhiro Imajima, Yamatokoriyama, and Shigeo Murase, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Nov. 1, 1971, Ser. No. 194,246

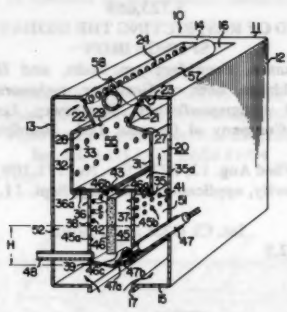
Claims priority, application Japan, Nov. 13, 1970, 45/100569; Nov. 13, 1970, 45/100570

Int. Cl. F23d 5/02

U.S. Cl. 431—339 **12 Claims**

A substantially flat type liquid fuel burner apparatus comprising a chamber for gasifying liquid fuel, a second chamber above the gasifying chamber for mixing the gasified fuel with an amount of air, and a combustion zone above the mixing chamber into which the gaseous mixture and an additional amount of air are introduced for the complete combustion of the gasified fuel. The air supplied to the gasifying chamber is limited to such an amount to burn only a part of the liquid fuel fed to the gasifying chamber so as to heat a heating element

disposed therein. The heated heating element is operative to pyrolyze the remaining part of the fuel into gasified fuel to



thereby facilitate blue flame complete combustion of the fuel in the combustion zone.

ERRATUM

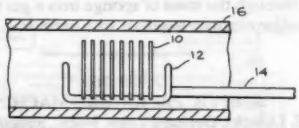
For Class 432—6 see:
Patent No. 3,723,053

3,723,053

HEAT TREATING PROCESS FOR SEMICONDUCTOR FABRICATION

Charles F. Myers, Scottsdale, Ariz., and Sandford Platter, Bolton, Mass., assignors to Robert L. Jarratt, Trustee in Bankruptcy for Semiconductor Electronic Memories Inc., by said Myers and Platter

Filed Oct. 26, 1971, Ser. No. 192,271
Int. Cl. F27b *9/00, 9/14*
U.S. Cl. 432—6 **7 Claims**



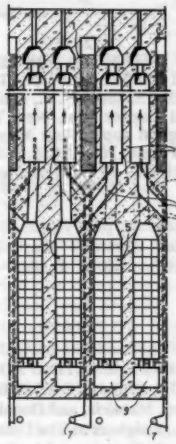
A method and means for heat treating semiconductor material used in diffusion processes or in any semiconductor fabrication process, when the temperature of the semiconductor material exceeds its plastic temperature, for minimizing stresses caused by temperature gradients in the material whereby a number of harmful dislocations, which result in undesired electrical characteristics for the semiconductor circuits on the wafer are eliminated.

3,723,054

INDUSTRIAL FURNACE

Wilhelm Jakobi; Ernst Kumper, both of Essen, and Hans Wagner, Kettwig, all of Germany, assignors to Heinrich Koppers G.m.b.H., Essen, Germany

Filed March 10, 1971, Ser. No. 123,188
Claims priority, application Germany, March 10, 1970, P 20 11 261.2
Int. Cl. F27d *17/00;* **C10b** *5/14, 5/16*
U.S. Cl. 263—15 R **3 Claims**



An industrial furnace has at least one furnace chamber and at least two hollow heat-exchange walls each located at and proximal to one lateral side of the furnace chamber so as to exchange heat with the same. At least two regenerators are provided each of which communicates with one of the heat-exchange walls and means is provided for alternately feeding air and flue gas to these regenerators.

CHEMICAL

3,723,055

ONE PASS CONTINUOUS DYEING OF POLYESTER/CELLULOSIC FIBERS A PLURALITY OF COLORS

Gilman S. Hooper, and Alois H. Springer, both of Spartanburg, S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 19, 1969, Ser. No. 886,731
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 C **6 Claims**

The process for dyeing polyester/cellulosic textiles which comprises applying to the textile a basic dyestuff and a disperse dyestuff, subjecting the resulting textile to steam under pressure, applying a dyestuff for the cellulosic component before or after said steam treatment and washing the dyed textile. Also, the resulting dyed textile.

3,723,056

MIXTURE OF PHENYLAZOPHENYLAZONAPHTHYL TRI(LITHIUM SULFONATE) DYESTUFFS

Alvin C. Litke, Seneca, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application May 12, 1969, Ser. No. 823,989, now Patent No. 3,635,944. Divided and this application Sept. 22, 1971, Ser. No. 182,882
Int. Cl. D21h *1/46*
U.S. Cl. 8—26 **1 Claim**

Highly water soluble phenylazophenylazonaphthyl tri-(lithium sulfonate) dyestuffs adapted to dye cellulosic fibers bright, light-fast violet shades.

3,723,057

PROCESS FOR STABILIZING ORGANOPHOSPHORUS SOLUTIONS AND IMPARTING ROT AND FLAME RESISTANCE TO ORGANIC TEXTILE MATERIALS

Darrell J. Donaldson, Metairie, and Donald J. Daigle, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture

Division of Ser. No. 845,562, July 28, 1969, Pat. No. 3,625,738. This application July 19, 1971, Ser. No. 164,043
Int. Cl. C07d *105/02*; D06m *13/28*; C07f *9/28*
U.S. Cl. 8—116 P **1 Claim**

Metal salts were found to stabilize tetrakis(hydroxymethyl)phosphonium hydroxide (THPOH)-ammonium hydroxide solutions by formation of complexes thereby making it possible to apply THPOH to cotton fabric from a single bath without the use of gaseous ammonia.

3,723,058

REMOVAL OF FREE FORMALDEHYDE FROM SOLUTIONS OF METHYLOLATED CARBAMATE FINISHING AGENTS AND TEXTILES TREATED THEREWITH

Robert M. Reinhardt, New Orleans, and Russell M. H. Kullman, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Apr. 27, 1972, Ser. No. 248,187
Int. Cl. D06m *15/58*
U.S. Cl. 8—182 **3 Claims**

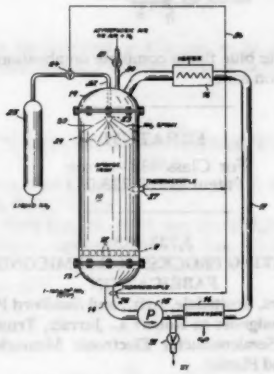
The free formaldehyde content of a solution of methylolated carbamate finishing agent is reduced by removal of free formaldehyde through reaction with phthalimide to give an insoluble phthalimide-formaldehyde adduct that is readily separated from the solution. Fabric sensitized by treatment with the so-modified solution has a low level of formaldehyde release. When the sensitized fabric is cured, the resultant fabric is wrinkle resistant and exhibits all the other properties characteristic of the carbamate finish.

3,723,059

METHOD OF RESTRICTING THE OXIDATION OF SPONGE IRON

Wilhelm Thumm, Frankfurt am Main, and Horst Nagel, Bergen-Enkhiem, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Reuterweg, Germany and The Steel Company of Canada, Ltd., Hamilton, Ontario, Canada

Filed Aug. 12, 1971, Ser. No. 171,109
Claims priority, application Germany, Sept. 11, 1970, P 19 27 300.8
Int. Cl. C23f *11/02, 9/02*
U.S. Cl. 21—2.5 **5 Claims**



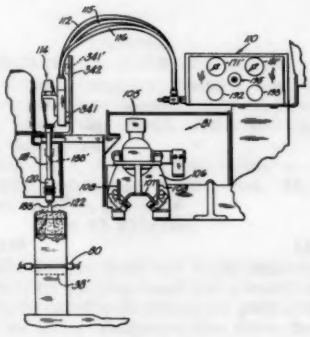
The oxidation of sponge iron, as generally made by the direct reduction of an iron ore, is prevented or limited by circulating through the mass of sponge iron a gas stream containing air and/or nitrogen together with ammonia.

3,723,060

ASEPTIC PACKAGING MACHINE

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Detroit, Mich.

Division of Ser. No. 708,337, Feb. 26, 1968, Pat. No. 3,566,575. This application Jan. 11, 1971, Ser. No. 105,449
Int. Cl. A61l *3/00*
U.S. Cl. 21—91 **8 Claims**



An aseptic packaging machine for forming, antiseptically treating, filling and sealing containers while protecting them with a clear air atmosphere after they have been antiseptically

treated by a bactericide. The antiseptic treatment is accomplished by a fogging system to provide for total contact by the bactericide with the internal surfaces of the container and includes ease of removal of the residual bactericide after the treatment.

3,723,061

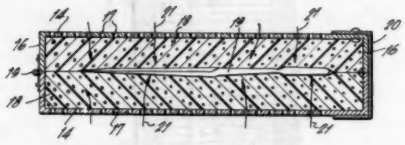
SURGICAL INSTRUMENT CASE

Norman O. Stahl, 201 Eastern Pky., Brooklyn, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,128

Int. Cl. A61l *3/02*; **B65d** *81/04*

U.S. Cl. 21—103 **5 Claims**



A container for surgical instruments having opposed porous plastic blocks to retain the instruments therebetween. The container together with the blocks and instruments may be sterilized and carried about without disturbing the relative positions of the instruments contained therein, and prevents their hitting against each other and being damaged.

3,723,062

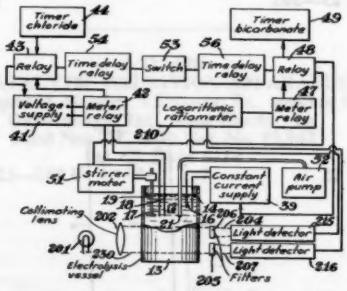
PHOTOELECTRIC ENDPOINT DETECTION

Harald Dahms, 22 Lakeview Rd., Ossining, N.Y.

Continuation-in-part of Ser. No. 690,270, Dec. 13, 1967, Pat. No. 3,551,109. This application Dec. 21, 1970, Ser. No. 100,306

Int. Cl. G01n *21/22, 31/16, 33/16*

U.S. Cl. 23—230 R **9 Claims**



A method and apparatus useful for colorimetric titration utilizes an indicator which changes from one colored form to another at or near an endpoint, and an optical endpoint detection system which generates signals responsive to the relative concentrations of the different colored forms of the indicator. The endpoint is indicated when the ratio of the logarithms of the signals reaches a predetermined value.

3,723,063

PROCESS FOR DETERMINATION OF CHEMICAL CONSTITUENTS OF PROTEINACEOUS BIOLOGICAL FLUIDS

Gerald M. Jones and Cleve W. Laird, Houston, Tex., assignors to Hycel, Inc., Houston, Tex.

No Drawing. Filed Feb. 19, 1971, Ser. No. 117,064

Int. Cl. G01n *33/16*

U.S. Cl. 23—230 B **26 Claims**

A process for quantitatively determining a chemical constituent of a proteinaceous biological fluid by heating a sample of the fluid to clot the protein therein, contacting the sample with the clotted protein therein with a solvent for the chemical constituent, reacting the chemical constituent with a reagent to form a product that can be measured in the presence of the clotted protein, and then measuring the quantity of the chemical constituent present. A number of examples are set forth.

3,723,064

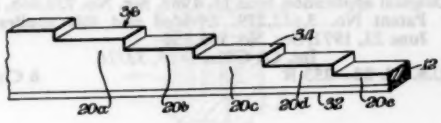
METHOD AND DEVICE FOR DETERMINING THE CONCENTRATION OF A MATERIAL IN A LIQUID

Lance A. Liotta, 14004 Mont Ave., East Cleveland, Ohio 44112

Filed July 26, 1971, Ser. No. 165,471

Int. Cl. G01n *31/06, 31/22*

U.S. Cl. 23—230 R **14 Claims**



A layered testing device is used for quantitatively determining the concentration of a substance. The layered device includes a first porous layer impregnated with a reagent system adapted to react with the test substance to produce an end product. Adjacent to the first porous layer is a membrane having plural regions each having a different permeability to said end product. The difference in permeability is obtained either by impregnating the regions with different concentrations of a chemical reactive with the end product or by varying the pore size in the regions. Adjacent the membrane there may be a porous element to aid in drawing the end product under test out of the membrane. Immediately adjacent to the porous element is an indicator layer containing an indicator substance for providing a visual indication of any of said end product reaching the indicator layer. By marking the indicator layer in accordance with the region's permeabilities, a visual indicator of and method of determining concentration is available.

3,723,065

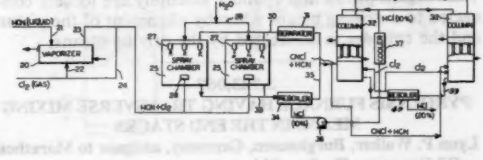
APPARATUS FOR PRODUCING CYANOGEN CHLORIDE BY SPRAY REACTION MEANS

Yelogondahally Subrananiam Suryanarayana, and William Sandford Durrell, both of Mobile, Ala., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 622,332, March 10, 1967, Pat. No. 3,498,761. This application Dec. 30, 1969, Ser. No. 1,908

Int. Cl. C01c *3/00*

U.S. Cl. 23—260 **1 Claim**



Apparatus for producing cyanogen chloride has a vaporizer in which hydrogen cyanide and chlorine are mixed to produce a gaseous mixture. A spray chamber is provided in which the gaseous mixture is dispersed, and means are provided for

spraying water into the spray chamber, the amount of water being controlled so that the resulting hydrochloric acid is at a concentration of about 10 percent. If necessary to complete the reaction, a cooled reactor can be provided into which the cyanogen chloride, unreacted hydrogen cyanide vapor and chlorine are passed. The reactor should be partially flooded with hydrochloric acid at a concentration of about 10–20 percent and chlorine stripped from the hydrochloric acid produced in the spray chamber is also fed to the reaction column.

3,723,066

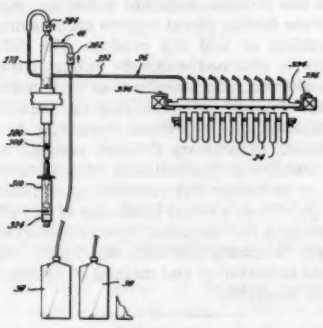
REAGENT DISPENSING MEANS FOR CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Original application June 14, 1968, Ser. No. 737,065, now Patent No. 3,622,279. Divided and this application June 21, 1971, Ser. No. 155,156

Int. Cl. G01n *1/18, 33/16*

U.S. Cl. 23—253 R **6 Claims**



An improved reagent dispensing means for use with an automatic chemical testing apparatus having a cylinder and piston of inert material with two one-way glass check valves having ground glass flat seating surfaces providing accurate control and metering of reagent therethrough. The outlet line of the reagent dispensing means is at an angle to the axis of the receiving tubes in the chemical testing apparatus to intimately mix the reagent with the contents of the tubes without requiring a stirrer. The reagent piston and cylinder assembly are loosely connected to a driving means whereby alignment of the piston and the cylinder is unaffected by the driving means.

3,723,067

PYROLYSIS FURNACE HAVING TRANSVERSE MIXING MEANS IN THE END STACKS

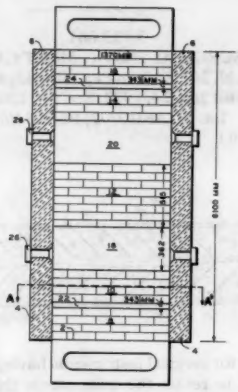
Lynn P. Walker, Burghausen, Germany, assignor to Marathon Oil Company, Findlay, Ohio

Filed Feb. 1, 1971, Ser. No. 111,509

Int. Cl. C07c *11/24*

U.S. Cl. 23—277 R **9 Claims**

A regenerative pyrolysis furnace having dual combustion chambers and means for transverse flow in the end stacks of the refractory masses. These means for transverse flow in the preheat and quench tile stacks permit crossflow between the



axial flow conduits, thereby minimizing the effects of plugging of these conduits due to carbon formation or shifting of tile.

3,723,068

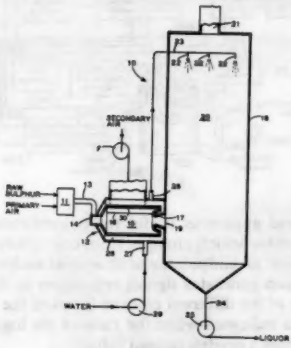
APPARATUS FOR THE PREPARATION OF SULFUR DIOXIDE

Robert A. McIlroy, Alliance, Warnie L. Sage, Louisville, and Henry P. Markant, Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Continuation-in-part of application Ser. No. 729,103, May 14, 1968. This application Dec. 14, 1970, Ser. No. 97,529

Int. Cl. C01b *17/54*

U.S. Cl. 23—262 **1 Claim**



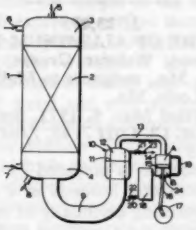
A system for preparing sulfur dioxide gas whereby sulfur is burned within a cyclone furnace supplied with a closely controlled amount of excess air to minimize sulfur trioxide formation. The furnace is constructed to assure substantially complete conversion of the sulfur to sulfur dioxide, with no liquid sulfur droplets entrained in the product gases. The combustion product gases from the furnace can be subsequently passed directly to and through a water spray tower for cooling and to remove any sulfur trioxide present.

3,723,069

PULSE COLUMN WITH PISTON DRIVE AND RESILIENT GAS CUSHION

Cristianus W. J. Van Koppen, Sittard, Netherlands, assignor to Stamicarbon N. V., Heerlen, Netherlands

Filed Feb. 24, 1971, Ser. No. 118,344
Claims priority, application Netherlands, March 5, 1970, 7003119
Int. Cl. B01d *11/04*; B01f *3/08*
U.S. Cl. 23—267 C 9 Claims



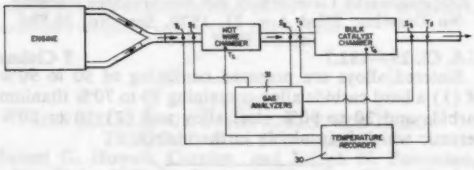
For controlling the amplitude of pulsations of liquid in a column partly filled with the liquid and having a pulsing chamber which communicates with a gas cushion alternately compressed and expanded at a constant amplitude and frequency comprising: increasing and decreasing the amount of gas in the gas cushion. In the installation according to the invention the space behind the piston in the cylinder is connected with a buffer space, the volume of which is at least as large as that of the gas cushion, while the spaces in front of and behind the piston in the cylinder are connected by means providing a restricted communication.

3,723,070

CATALYTIC OXIDATION APPARATUS

Jacques H. Houdry, Villanova, Pa., assignor to Oxy-Catalyst, Inc., West Chester, Pa.

Filed Nov. 27, 1970, Ser. No. 93,042
Int. Cl. F01n *3/14*
U.S. Cl. 23—288 F 22 Claims



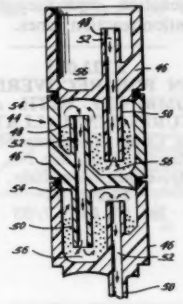
Internal combustion engine exhaust gases are catalytically oxidized by providing in the gas stream a catalytic hot resistance element of small mass and surface area and a downstream catalyst bed of large mass and surface area. The hot resistance element quickly reaches catalytically effective temperature, and its heat plus heat of catalytic oxidation coact to accelerate the heating of the large catalyst bed accelerating its heating and causing it quickly to reach its effective catalytic operating temperature.

3,723,071

CONTACT APPARATUS

Hart Brown, 5300 Brownway Road, Houston, Tex. 77027

Continuation-in-part of application Ser. No. 701,906, Jan. 31, 1968. This application Sept. 3, 1970, Ser. No. 69,281
Int. Cl. B01j *1/00, 9/20*; C22b *3/00*
U.S. Cl. 23—283 7 Claims



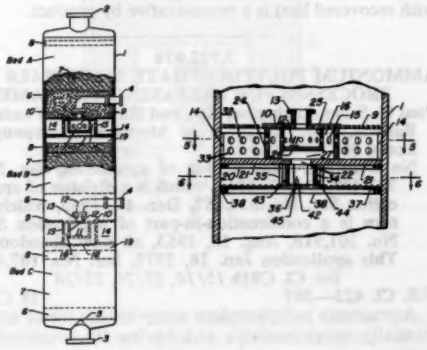
An apparatus for providing intimate contact between fluid and solid particles having a tray structure with bowls on one side in which the particles are fluidized for contact and passages extend through the tray structure to prevent particle movement therethrough with flow in one direction and to cause particles to move therethrough responsive to flow in the opposite direction and also having a tray structure with parallel imperforate trays with tubes extending through each tray and being out of alignment with the tubes of the other tray.

3,723,072

FLUID CONTACTING APPARATUS

Don B. Carson and William R. Hennemuth, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation of application Ser. No. 835,449, June 23, 1969. This application Mar. 12, 1971, Ser. No. 123,500
The portion of the term of the patent subsequent to Aug. 10, 1988, has been disclaimed
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 R 32 Claims



An apparatus for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is passed into a central chamber

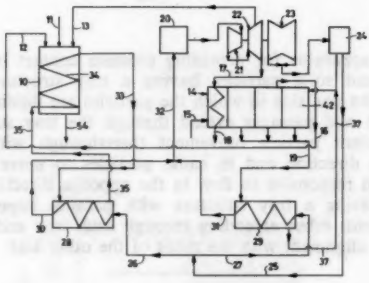
having a plurality of fluid openings in the chamber wall, while a second fluid is passed into an annular chamber encompassing the central chamber and spaced apart therefrom. The second fluid is discharged via fluid openings in the inner annular chamber wall, into an annular space between the chambers, and the first fluid is discharged from the central chamber into the second fluid discharge. A resulting fluid mixture is passed from the annular space into a second chamber or conduit for further mixing and then to a bed of particulated contact solids. Specific application is hydrogenation, hydrotreating, hydrocracking, and hydrodealkylation reaction zones.

3,723,073

INSTALLATION FOR RECOVERING ELECTRIC POWER, COMBINED WITH AN ALUMINA MANUFACTURING INSTALLATION

Francesco Ettore Conti, Via Sismondi 3, Milan, Italy

Filed May 26, 1969, Ser. No. 827,869
Claims priority, application Italy, June 3, 1968, 17,285/68
Int. Cl. C01f *7/06*
U.S. Cl. 23—293 **12 Claims**



An installation for producing electric power from heat recovered in an alumina producing installation run according to the Bayer process is disclosed, in which a combination of heat exchanging means is provided, for recovering the heat produced in the reaction of bauxite with a caustic alkali, and also for recovering the heat from steam used in the several stages of the power-generating turboalternator which is an integral part of the power station fed by waste heat. A considerable overall efficiency is obtained, so that the electric power produced with recovered heat is a remunerative by-product.

3,723,074

AMMONIUM POLYPHOSPHATE MATERIALS AND PROCESSES FOR PREPARING THE SAME

Paul G. Sears, Lexington, Ky., and Howard L. Vandersall, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation of application Ser. No. 722,499, Dec. 7, 1967, which is a division of application Ser. No. 514,657, Dec. 17, 1965, which in turn is a continuation-in-part of application Ser. No. 301,918, Aug. 13, 1963, all now abandoned. This application Jan. 18, 1971, Ser. No. 107,481
Int. Cl. C01b *15/16, 25/26, 25/28*
U.S. Cl. 423—307 **18 Claims**

Ammonium polyphosphate compositions which are substantially water-insoluble and having the empirical formula

$$H_{(n-m)+2}(NH_4)_mP_nO_{3n+1}$$

wherein n is an integer having an average value greater than 10 and m/n has an average value between about .7 and about 1.1 and the maximum value of m is equal to $n+2$, are disclosed. These ammonium phosphates are prepared by heat treating either (a) the reaction product of a condensed phosphoric acid and a combined ammoniating and condensing agent, (b) reaction product of an orthophosphoric acid and a combined ammoniating and condensing agent, (c) an ammonium orthophosphate and a combined ammoniating and condensing agent, (d) an ammonium pyrophosphate salt and a combined ammoniating and condensing agent, or (e) urea phosphate, at a temperature up to about 260° C. The typical ammoniating and condensing agent is urea. The ammonium polyphosphates are useful as fire retardants, builders in synthetic detergent compositions and as a fertilizer.

3,723,075

MANUFACTURE OF ALUMINUM TRIBROMIDE

John W. Stevenson, Webster Groves, and Warren T. Trask, Olivette, Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

No Drawing. Filed Mar. 5, 1971, Ser. No. 121,575
Int. Cl. C01f *7/48, 7/64*
U.S. Cl. 423—495 **5 Claims**

Aluminum tribromide is prepared by reacting metallic aluminum with elemental bromine in a stirred liquid reaction medium consisting essentially of molten aluminum tribromide. Preferably the aluminum in the form of small pieces or particles is suspended in the molten aluminum tribromide and the elemental bromine is added incrementally to the surface of the reaction medium at a rate such that the temperature of the medium is preferably maintained within the range of about 100–140° C. The method is suitable for continuous operation.

3,723,076

SINTERED TUNGSTEN-BORON ALLOY

Friedrich Benesovsky, Tirol, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

Filed Dec. 10, 1969, Ser. No. 884,053
Claims priority, application Austria, Dec. 23, 1968, 12550/68
Int. Cl. B22f *1/00*; C22c *1/00*
U.S. Cl. 29—182 **15 Claims**

This application relates to a sintered tungsten-boron alloy optionally containing small amounts of certain other additives with the boron content of the alloy being less than about 0.05 weight per cent and preferably between 0.005 and 0.02 weight per cent.

3,723,077

SINTERED ALLOYS

Fritz Frehn, Krefeld, Germany, assignor to Deutsche Edelstahlwerke Gesellschaft mit beschrankter Haftung

No Drawing. Filed Apr. 21, 1970, Ser. No. 30,596
Int. Cl. B22f *1/00*
U.S. Cl. 29—182.7 **7 Claims**

Sintered alloys are prepared consisting of 50 to 90% of (1) a hard carbide alloy containing 10 to 70% titanium carbide and 30 to 90% steel alloy and (2) 10 to 50% ceramic which is insoluble in the matrix.

3,723,078

ELECTROLESS ALLOY COATINGS HAVING METALLIC PARTICLES DISPERSED THERETHROUGH

Konrad Parker, Park Ridge, Ill., assignor to General American Transportation Corporation, Chicago, Ill.

Original application Oct. 25, 1968, Ser. No. 770,573, now Patent No. 3,562,000, dated Feb. 9, 1971. Divided and this application Sept. 28, 1970, Ser. No. 75,829
Int. Cl. B32b *15/00*
U.S. Cl. 29—194 **37 Claims**

There are disclosed herein processes for electroless metallizing workpieces to provide thereon an electroless

plating metal coating incorporating therein metallic particles, workpieces produced by such processes and plating baths which are useful in the practice of such processes and for producing such workpieces. These processes generally comprise contacting the workpieces with an electroless metallizing bath consisting of an aqueous solution of an electroless metal plating salt and a chemical reducing agent therefor and a quantity of metallic particles, wherein said particles are essentially insoluble in said bath and inert and non-catalytic and non-poisonous with respect thereto and non-displacing with respect to the electroless plating metal ions in said bath, the particles being present in said bath in an amount by weight no greater than about ten times the weight of the electroless plating metal in said bath expressed as free metal, and maintaining the particles in suspension throughout the bath during the metallizing of the workpiece; the metallizing bath may contain nickel ions or cobalt ions or mixtures thereof as a source of metal and may contain hypophosphite anion or an alkylborazane or a borohydride as the reducing agent, or may contain copper ions as a source of metal with formaldehyde as the reducing agent; the metallic particles are selected from chromium, molybdenum, tungsten, boron, titanium, vanadium, zirconium, niobium, tantalum and alloys thereof; the metallic particles have dimensions in the range from about 0.1 micron to 50 microns; these metallic particles may be maintained in suspension in the bath by mechanical agitation, by passing the bath including the particles over the workpiece, by passing streams of minute bubbles of gas through the bath, by agitation and movement of the workpiece within the bath, or by slowly rotating the workpiece in conjunction with the rapid circulation of the bath; additionally, the electroless plating metal coating having the metallic particles incorporated therein may be heat-treated by heating to a temperature in the range from about 200° C. to about 1,300° C. for at least one-quarter hour to bond said electroless metal coating and said metallic particles at the interfaces thereof.

3,723,079

STABILIZATION OF COAL

Walter H. Seltzer, Marcus Hook, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed July 23, 1971, Ser. No. 165,728

Int. Cl. C10l 5/00

U.S. Cl. 44—1 R **2 Claims**

A process for stabilizing dried lignitic and subbituminous coal against spontaneous combustion which comprises treating said dried coal at about 175° to about 225° C. with oxygen in an amount of from about 0.5 percent to about 8 percent by weight of said coal and rehydrating the oxygen treated coal with water in an amount of from about 1.5 percent to about 6 percent by weight of said oxygen treated coal.

3,723,080

ION-EXCHANGE STRENGTHENED ELECTRICALLY-HEATED GLASS

Robert G. Howell, Corning, and Joseph N. Panzarino, Big Flats, N.Y., assignors to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Feb. 12, 1971, Ser. No. 115,125

Int. Cl. C03c 17/00, 21/00

U.S. Cl. 65—30 **5 Claims**

Chemically strengthened, electrically-heatable glass for vehicle windows and the like, and a method of making it, comprising the steps of coating at least one surface of a soda aluminosilicate glass with an electroconductive paste to form a resistance heating grid, drying, firing the coated glass to a temperature sufficient to fuse the paste, and if desired, to sag the glass, and finally subjecting the fired glass to a source of exchangeable K^+ ions at a temperature below the strain point of the glass for a time sufficient to form a compressively stressed surface layer thereon.

3,723,081

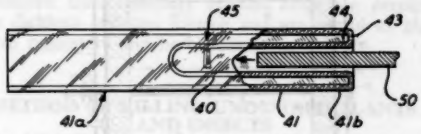
BREAK SEAL

Stephen D. Poulsen, Jr., Florham Park, N.J., assignor to Airco, Inc.

Original application May 21, 1970, Ser. No. 39,193. Divided and this application Nov. 26, 1971, Ser. No. 202,701

Int. Cl. C03b 23/00

U.S. Cl. 65—55 **5 Claims**



This invention relates to an improved form of break seal which is especially adapted to be used as a closure for a container or which may otherwise be used to form a hermetic seal in laboratory equipment. In its preferred form the break seal is fabricated from soft or borosilicate glass and takes the form of an external tube joined to an internal test tube having an indentation in its sidewall. The indentation forms a weak point in the sidewall of the test tube and in the event that the seal is to be broken an actuating device is pressed against the indentation causing a rupture in the sidewall of the glass tube.

3,723,082

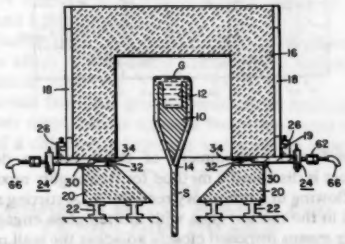
SHEET GLASS THICKNESS CONTROL

Daniel H. Knowles, Painted Post, George D. Lapinsky, Corning, Kenneth T. Overman, Painted Post, and Raphael A. Simon, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,413

Int. Cl. C03b 17/00

U.S. Cl. 65—84 **4 Claims**



In the formation of sheet material from molten glass, a plurality of spot cooling jets are positioned in the forming area, and preferably in a row along the draw line, for directing individual streams of extremely low volume air on discrete portions of the molten glass adjacent to the draw line to control local thickness variations in the sheet and thereby provide uniform glass thickness across its extent.

3,723,083

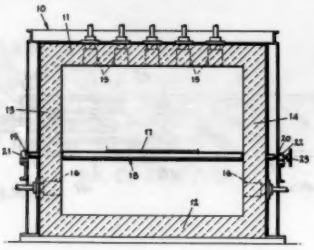
TEXTURED CONVEYOR ROLL AND METHOD OF FINISHING THE SAME

George F. Ritter, Jr., Rossford, and Roger P. King, Toledo, both of Ohio, assignors to Libby-Owens-Ford Company, Toledo, Ohio

Continuation of Ser. No. 676,794, Oct. 20, 1967, abandoned. This application Dec. 23, 1970, Ser. No. 101,196

Int. Cl. C03b 25/04

U.S. Cl. 65—119 3 Claims



The conveyor roll disclosed is provided with a special textured surface finish and is of particular utility for support and conveying glass sheets during heating thereof from room temperature to a relatively high temperature, said textured surface finish reducing the area of contact between the roll and glass sheets, thereby lowering the rate of heat transfer and lessening the liability of breakage of the glass.

3,723,084

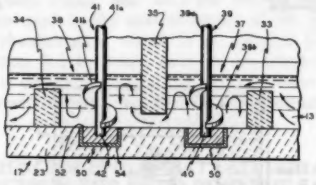
METHOD AND APPARATUS FOR BLENDING MOLTEN GLASS

Robert D. Colchagoff, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed May 7, 1971, Ser. No. 141,305

Int. Cl. C03b 5/18, 5/32

U.S. Cl. 65—136 24 Claims



In a preferred embodiment of the invention described herein there is disclosed a method for thoroughly mixing molten glass flowing in a refractory receptacle. A stirring means is immersed in the molten glass with molten glass engaging and circulating means disposed closely adjacent the wall means of the receptacle. Protective shielding is interposed between the stirring means and the refractory of the receptacle to prevent erosion of the refractory. The stirring means is driven to remove relatively viscous and cooler molten glass from adjacent the wall means to mix and blend such gas with hotter, less viscous glass away from the wall means of the receptacle. In the preferred embodiments shown the stirring means is disposed closely adjacent a bottom wall of the protective. A pool of protective fluid having a density greater than the molten glass is retained between the stirring means and the refractory of the receptacle. The pool of protective fluid is preferably a molten metal which has a boiling temperature higher than the temperature of the molten glass. A layer of material is interposed between the pool and the refractory to retain the pool in protective disposition between the stirrer and the refractory.

3,723,085

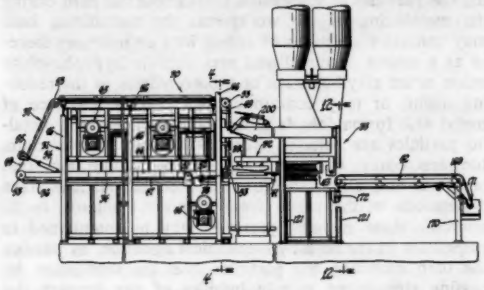
APPARATUS FOR CONVEYING GLASS SHEETS THROUGH ADJACENT BENDING AND TEMPERING STATIONS

Harold A. McMaster, Woodville, Ohio, assignor to Guardian Industries Corp., Detroit, Mich.

Original application Dec. 18, 1967, Ser. No. 691,326. Divided and this application Apr. 12, 1971, Ser. No. 132,941

Int. Cl. C03b 18/02

U.S. Cl. 65—182 A 31 Claims



An apparatus for curving a sheet of glass including a furnace having an elongated gas support bed for supporting sheets of glass thereover, conveying means for moving a sheet from the first end to the second end of the bed, a bending station disposed adjacent the second end of the bed and including a sheet supporting surface for supporting a sheet of glass on gases thereover, a shuttle means for moving a sheet of glass from the second end of the bed to the gas supporting surface in the bending station, a blasthead adjacent the bending station for impinging fluid against opposite sides of the sheet for cooling thereof, oscillating means in the blasthead for oscillating a sheet therein, and unitary frame means for lifting a sheet from the gas supporting surface in the bending station for bending the sheet and for thereafter moving the sheet into the blasthead while at the same time removing a sheet from the oscillating means in the blasthead to remove the sheet from the blasthead. The independently novel features of the conveying assembly are the shuttle means and its specific structure for moving a sheet of glass from the furnace to the bending station, the single unitary frame means for supporting a sheet in the bending station and moving it into the blasthead while simultaneously removing a sheet from the blasthead, the unique support of the forming surface means in the bending station against which a sheet is pressed for curving thereof, and an oscillating means in the blasthead for removing a sheet from the frame means and oscillating the sheet in the blasthead while it is being cooled.

3,723,086

PROCESS FOR PRODUCING AMMONIUM PHOSPHATES AND POLYPHOSPHATES

Paul C. Poynor, 2512 Woodthrush Road, and William H. Kegler, Osage Oak Mobile Homes-E-E of City both of Ponca City, Okla.

Filed May 20, 1971, Ser. No. 148,259

Int. Cl. C05b 7/00

U.S. Cl. 71—29 4 Claims

An improved process for producing ammonium phosphates and polyphosphates in a pipe reactor. The improvement com-

prises the addition of urea to a stream of merchant grade wet process phosphoric acid prior to commingling the acid stream with a stream of ammonia within a confined zone to reduce the formation of insoluble ammonium phosphate materials which tend to block the fluid flow in the confined zone.

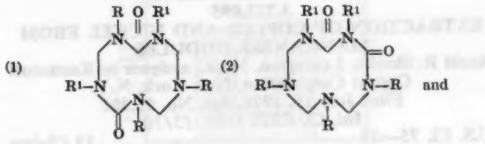
3,723,087

HERBICIDAL COMPOSITIONS AND METHODS

John P. Chapp, Kirkwood, Mo., assignor to Monsanto Company, Saint Louis, Mo.

Division of Ser. No. 623,541, March 16, 1967, Pat. No. 3,609,143. This application Sept. 9, 1970, Ser. No. 70,892
Int. Cl. A01n 9/22
U.S. Cl. 71—92 8 Claims

Phytotoxic and soil sterilant compositions containing compounds of the formula $(CH_2=N-R)_3(R^1NCO)_2$ and having either of the following structures:



(3) mixtures of (1) and (2)

wherein R is alkyl having a maximum of four carbon atoms and R^1 is selected from the group consisting of mono- and dihalo-substituted phenyl and monoitrosubstituted phenyl are disclosed as well as phytotoxic methods employing such compositions.

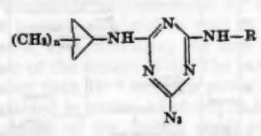
3,723,088

HERBICIDAL COMPOSITIONS AND METHODS

Dagmar Berrer, Riehn/Baselstadt, and Christian Vogel, Binningen/Baselland, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 807,431, March 14, 1969, Pat. No. 3,583,987. This application Oct. 28, 1970, Ser. No. 84,863
Claims priority, application Switzerland, March 20, 1968, 4148/68
Int. Cl. A01n 9/22
U.S. Cl. 71—93 10 Claims

Herbicidal compositions comprising azido-triazine derivatives of the formula



wherein *n* means 0 or 1 and R represents certain unsubstituted or substituted alkyl groups having a total of from three to six carbon atoms as herbicidally active compounds of enhanced toxicity to undesirable plant growth and improved selectivity are disclosed. A method of controlling undesirable plant growth with such compounds and compositions containing them as the active ingredient are also described.

3,723,089

METHOD OF CONTROLLING WEEDS WITH ORGANOTIN COMPOUNDS

Donald J. Peterson, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,019
Int. Cl. A01n 9/22
U.S. Cl. 71—94 6 Claims

Disclosed herein are compositions and a method for controlling the growth of weeds by contacting weeds with a growth-controlling amount of certain N,N-disubstituted aminomethyl trialkyl tin compounds or quaternary ammonium salts thereof.

3,723,090

DICHLORO TRIFLUOROMETHYL BENZOIC ACIDS AS AGROCHEMICAL AGENTS

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 816,084, Apr. 14, 1969, which is a continuation-in-part of application Ser. No. 729,944, May 17, 1968, now abandoned. This application Jan. 22, 1971, Ser. No. 109,012
Int. Cl. A01n 9/24
U.S. Cl. 71—115 9 Claims

Dichloro trifluoromethyl benzoic acids are prepared from dichloro trifluoro toluene and are useful as plant growth regulators and herbicides.

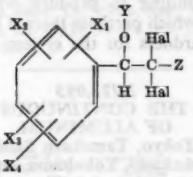
3,723,091

METHOD OF KILLING UNDESIRED PLANTS AND INSECTS

Andre Allais, Les Lilas, and Pierre Girault, Paris, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Filed July 17, 1968, Ser. No. 745,365
Claims priority, application France, July 18, 1967, 114,639; June 6, 1968, 153,981
Int. Cl. A01n 9/24
U.S. Cl. 71—122 16 Claims

Pesticidal halogenated organic compounds derived from 1-phenyl-2,2-dihalogeno ethanol, of general Formula I:



(I)

wherein

X_1 is selected from the group consisting of hydrogen, a halogen atom, a nitro group, a substituted or unsubstituted lower alkyl, and a lower alkyloxyl,

X_2, identical with X_1 or different from X_1 is selected from the group consisting of hydrogen, a halogen atom, a substituted or unsubstituted lower alkyl and a lower alkyloxyl,

X_3 and X_4, identical with or different from one another and identical with or different from X_1 and/or X_2 are selected from the group consisting of hydrogen and a halogen atom,

Y is selected from the group consisting of hydrogen, a lower alkyl, a lower acyl and a group derived from a mineral acid,

Z is selected from the group consisting of hydrogen and a lower alkyl, Hal is selected from the group consisting of a chlorine, a bromine and a iodine atom.

3,723,092

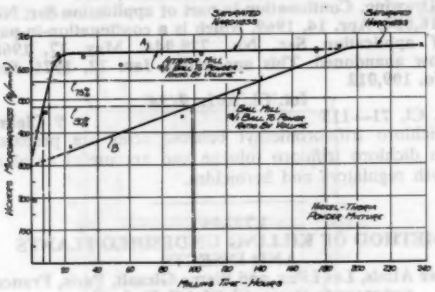
COMPOSITE METAL POWDER AND PRODUCTION THEREOF

John Stanwood Benjamin, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 709,700, Mar. 1, 1968, now Patent No. 3,591,362. This application Sept. 28, 1970, Ser. No. 75,882
Int. Cl. B22f 9/00
U.S. Cl. 75—.5 R 27 Claims

A wrought composite metal powder, or mechanically alloyed metal powder, is provided comprised of a plurality of constituents, at least one of which is a metal capable of being compressively deformed, the composite powder being preferably in the heavily cold worked condition, i.e., having substantially the saturation hardness

for the system involved, the particles thereof being characterized metallographically by an internal structure comprised of the starting constituents intimately united together and identifiably mutually interdispersed. The process employed in producing the composite metal powder resides in providing a dry charge of attritive elements and a powder mass comprising a plurality of constituents, at


Saturated Hardness
Saturated Hardness
Attritive Mill 10% Ball To Powder Ratio By Volume
Ball Mill 10% Ball To Powder Ratio By Volume
Nickel-Titanium Powder Mixture
Hardness (Rockwell C)
Milling Time - Hours

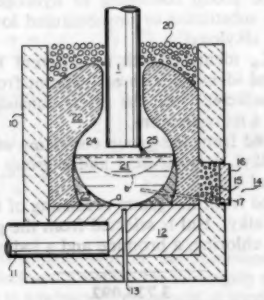
least one of which is a metal capable of being compressively deformed, subjecting the charge to agitation milling under high energy conditions in which a substantial portion or cross section of the charge is maintained kinetically in a highly activated state of relative motion, and continuing the milling to produce wrought composite metal powder in which particles thereof have substantially the saturation hardness for the system involved.

3,723,093

PROCESS FOR THE CONTINUOUS PRODUCTION OF ALUMINUM

Tadahisa Shiba, Tokyo, Tamekazu Saito, Junzo Tsurugi, and Masaru Takahashi, Yokohama, and Kunihiro Goto, Kawasaki, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1970, Ser. No. 34,652
Int. Cl. C22f *7/00, 21/00;* **C22d** *7/02*
U.S. Cl. 75—10 R **7 Claims**



A process for the production of aluminum which comprises subjecting a charge of alumina and carbon to the action of an electric arc in a furnace to form a molten mixture comprising aluminum and aluminum carbide, thereafter repeating the steps of (a) allowing the thus formed mixture to cool within the furnace to a temperature within the range of 1900–1400° C. (b) withdrawing free aluminum still in the molten state in said mixture out of the furnace and recovering the same, and (c) again subjecting the remainder in the furnace to the action of the electric arc, while feeding a subsequent charge of alumina and carbon, to form said molten mixture.

3,723,094

ELECTROFLUX SLAGS AND METHODS OF ELECTROFLUX REMELTING

Rene Schlatter, Derry Township, Westmoreland County, Pa., assignor to Latrobe Steel Company

No Drawing. Filed Sept. 1, 1971, Ser. No. 177,177
Int. Cl. C21c *5/52, 7/02*
U.S. Cl. 75—12 **6 Claims**

A method and a slag are provided for remelting sulfurized tool steels so as to retain control of the sulfur. The method of the invention includes melting a sulfurized tool steel, forming the steel into an electrode for electroflux remelting, remelting the electrode in an electroflux remelt practice under a slag having the composition CaF_2 about 35% to about 60%, Al_2O_3 about 20% to about 40%, SiO_2 about 10% to about 30% and $CaSO_4$ about 3% to 10% and finally solidifying the remelted sulfurized tool steel as an ingot.

3,723,095

EXTRACTION OF COPPER AND NICKEL FROM MANGANESE NODULES

Roald R. Skarbo, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,305
Int. Cl. C22b *3/00, 15/10*
U.S. Cl. 75—21 **13 Claims**

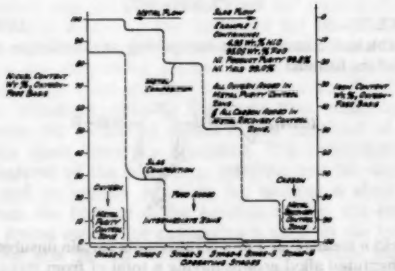
Copper and nickel may be leached from complex ores containing manganese, iron, copper, nickel by leaching the complex ore with a solution containing manganous ions.

3,723,096

PRODUCTION OF METALS FROM METALLIFEROUS MATERIALS

Norman A. D. Parlee, Los Altos Hills, Calif., and William E. Mahin, Ashland, Oreg., assignors to Kaiser Industries Corporation, Oakland, Calif.

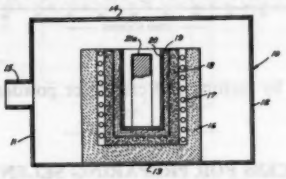
Continuation-in-part of abandoned application Ser. No. 22,766, Mar. 26, 1970. This application Nov. 9, 1970, Ser. No. 88,023
Int. Cl. C21b *15/00;* **C22b** *7/00*
U.S. Cl. 75—21 **50 Claims**



In a furnace system, a process for separating and recovering a desired metal element from metalliferous materials, such as ores and alloys. A liquid slag phase of the oxides of the desired metal element and more oxidizable elements and a liquid metal phase containing the desired metal element and more oxidizable elements are caused to flow in paths extending between and inclusive of a metal purity control zone and a metal recovery control zone. The desired metal in high purity is obtained by maintaining a slag phase in the metal purity control zone that is rich in the oxide of the desired metal. Obtaining the desired metal in high yield is ensured by maintaining a metal phase in the metal recovery control zone that contains predetermined concentrations of the

more oxidizable elements. In one embodiment, the desired metal element and a more oxidizable metal element, both contained in a metalliferous material are recovered in separate liquid metal streams from a single furnace. The removal of certain impurities, such as phosphorus in iron, may require treatment with a reactive flux.

3,723,097
METHOD OF PREVENTING DROSS FORMATION DURING REMELTING
Harold L. Wheaton, Kensington, and Thomas H. Bishop, Alliance, Ohio, assignors to TRW Inc., Cleveland, Ohio
Filed Jan. 18, 1971, Ser. No. 107,110
Int. Cl. C22d *7/06*
U.S. Cl. 75—10 V **7 Claims**



Method of mimimizing dross formation during vacuum remelting of a nickel base or cobalt base alloy which is normally reactive with oxygen, by applying a metallic barrier layer about a charge of the alloy, the barrier layer being composed of a metal having a substantially lower affinity for oxygen than the reactive metals in the alloy, and melting the charge under vacuum conditions.

3,723,098
METHOD OF MANUFACTURING IRON BASE ALLOYS
Charles d'A. Hunt, Moraga, Calif., assignor to Airco Inc.
Continuation-in-part of application Ser. No. 722,640, Apr. 19, 1968, which is a continuation-in-part of application Ser. No. 636,666, May 8, 1967. This application June 15, 1970, Ser. No. 46,156
Int. Cl. C21c *5/52*; C22d *7/00*
U.S. Cl. 75—12 **11 Claims**

Iron base alloys are manufactured by electron beam bombardment heating of a molten pool of an alloy at a reduced pressure, and controlling the heat input and the throughput rate of the molten alloy. The pressure is maintained no greater than 10^{-1} torr, the power density of the beam is maintained in excess of about 20 kw. per square foot of the surface of the molten pool, and the molten alloy is exposed to the electron beam bombardment for a period sufficient to reduce the volatile metallic impurities to extremely low levels.

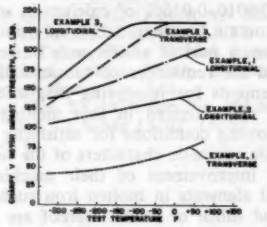
3,723,099
METHOD FOR STATIC CONTROL OF AN OXYGEN BLOWN CONVERTER
Katsukiyo Marukawa, Wakayama, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan
Filed Dec. 29, 1970, Ser. No. 102,445
Claims priority, application Japan, Jan. 28, 1970, 45/6,982
Int. Cl. C21c *7/00*
U.S. Cl. 75—60 **2 Claims**

The method for controlling an oxygen blown converter comprising the steps of accumulating decarburizing characteristic values of the past charges obtained by analyzing waste gases exhausted from the mouth of the converter, sorting out charges of the past having refining conditions similar to those of the present control charge to make them the reference charges, calculating the total required amount of oxygen blown assuming that the decarburizing conditions of the reference charges will reappear in the present control charges, and blowing oxygen with such values as the predetermined values.

3,723,100
CORE WIRE MATERIAL FOR WELDING OF SPHEROIDAL GRAPHITE CAST IRON
Hiroshi Matsumoto, Yono, Japan, assignor to Tokyo Kakin Kogyo Co., Ltd., Tokyo, Japan
Filed Mar. 3, 1971, Ser. No. 120,420
Claims priority, application Japan, Mar. 11, 1970, 45/20,347
Int. Cl. C22c *37/04*
U.S. Cl. 75—123 CB **1 Claim**

A core wire material for welding spheroidal graphite cast iron having a spheroidized graphite structure consisting essentially of 2.5 to 4.5% by weight of C, 1 to 4.5% by weight of Si, 0.005 to 0.1% by weight of Mn, 0.003 to 0.08% by weight of P, 0.001 to 0.01% by weight of S, more than 0.006% by weight of Ca, more than 0.0002% by weight of Ba and the balance being essentially Fe.

3,723,101
IRON BASE ALLOYS HAVING LOW LEVELS OF VOLATILE METALLIC IMPURITIES
Charles d'A. Hunt, Moraga, Calif., assignor to Airco, Inc.
Continuation-in-part of application Ser. No. 722,640, Apr. 19, 1968, which is a continuation-in-part of application Ser. No. 636,666, May 8, 1967, both now abandoned. This application June 15, 1970, Ser. No. 46,443
Int. Cl. C22c *39/14, 39/20*
U.S. Cl. 75—126 R **13 Claims**

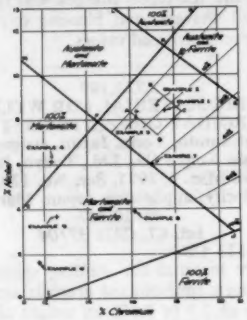


Iron base alloys having substantially improved physical and mechanical properties containing between about 4 and about 40% chromium, between 0 and about 15% nickel, low levels of carbon and nitrogen such that the carbon and nitrogen are in solid solution at room temperature, not more than about 6 p.p.m. total of the insoluble volatile metallic impurities lead, bismuth, cadmium, sodium, potassium, silver, calcium, magnesium, and barium, and not more than about 20 p.p.m. of the soluble volatile metallic impurities zinc and antimony.

3,723,102
HIGH STRENGTH IRON-CHROMIUM-NICKEL ALLOY
James H. C. Lowe, Moraga, Calif., assignor to Airco, Inc., New York, N.Y.
Filed June 15, 1970, Ser. No. 46,393
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 R **7 Claims**

Iron-chromium-nickel alloys having improved physical properties containing between 16 and 18 percent chromium and between 7 and 9 percent nickel, low levels of carbon and

nitrogen, not more than 6 ppm of insoluble volatile metallic impurities and not more than about 20 ppm soluble volatile



metallic impurities. The alloys have yield strengths above 70 KSI at room temperature and impact strengths above 20 foot pounds at −320° F.

3,723,103
PROCESS FOR PRODUCING SOFT MAGNETIC MATERIALS

Tetsuo Kato and Katsusi Kusaka, Nagoya, Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya-shi, Aichi-ken, Japan

Filed July 10, 1970, Ser. No. 53,893
Int. Cl. C22c *39/04*
U.S. Cl. 75—129 **7 Claims**

A process for porducing soft magnetic alloys having improved cutting properties together with the intrinsic magnetic characters thereof which comprises adding at least one of elements of 0.03–0.30% of lead, 0.03–0.40% of selenium, 0.01–0.10% of tellurium, 0.03–0.40% of bismuth and 0.0010–0.010% of calcium in soft magnetic alloys which contain less than 0.05% of carbon, less than 5.0% of silicon, a part of silicon may be replaced with aluminum, and the remainder of substantially iron with or without elements for improving magnetic characters of the alloys, characterized in that melting is effected under the following conditions for satisfying both insurance of intrinsic magnetic characters of the soft magnetic materials and improvement of their machinabilities:

(i) Harmful elements in molten iron such as carbon, phosphorus and sulfur or oxides thereof are removed as far as possible.

(ii) Oxygen content in the molten iron before the addition of the above elements for improving machinabilities is maintained at most 200 p.p.m.

(iii) Temperature of molten iron at the time of the addition of the alloying elements for improving machinabilities is held at a temperature between 1570–1800° C.

(iv) The alloying elements for improving machinabilities are added in the form of fine particles or liquid state.

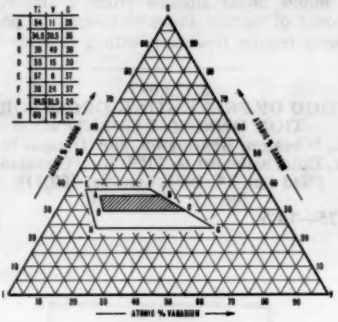
(v) The alloying elements for improving machinabilities are added in molten irons with thoroughly stirring.

3,723,104
REFRACTORY METAL ALLOY BONDED CARBIDES FOR CUTTING TOOL APPLICATIONS

Erwin Rudy, Beaverton, Oreg., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed July 29, 1970, Ser. No. 59,063
Int. Cl. C22c *29/00*
U.S. Cl. 75—134 M **44 Claims**

This patent describes a refractory metal bonded carbide alloy for use in cutting tools and in other applications where high hardness and abrasion resistance are required. The desired fine-grained composite structure is obtained preferably by metal phase precipitation of metal alloys within the carbide grains, of previously prepared certain ternary or higher alloys of refractory transition metals with carbon. Consolidation of the composites can be accomplished by melting and casting or powder metallurgy techniques.



3,723,105
PROCESS FOR PREPARING SELENIUM-TELLURIUM ALLOYS

Nobuo Kitajima and Tatsuo Masaki, Tokyo, and Hideyo Kondo, Ibaragi-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 13, 1971, Ser. No. 180,000
Claims priority, application Japan, Sept. 19, 1970, 45/82,399
Int. Cl. C22c *1/02*; G03g *5/02*
U.S. Cl. 75—134 H **1 Claim**

A selenium-tellurium alloy suitable for electrophotographic photosensitive member is prepared by heating a mixture of selenium and tellurium containing 1–25% by weight of tellurium to a temperative not lower than 350° C. to melt the mixture, cooling gradually the molten selenium and tellurium to around the melting point of the selenium-tellurium alloy at a rate not higher than 100° C./hr. and then quenching to room temperature within 10 minutes.

3,723,106
MAGNETIC ALLOY

Juergen Schlenker, Parsippany, and Teh Po Wang, Cedar Grove, N.J., assignors to Wilbur B. Driver Co.

No Drawing. Filed May 23, 1969, Ser. No. 827,180
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 **3 Claims**

A magnetic alloy characterized by high permeability at low flux density and comprising, as expressed in percent by weight:

Molybdenum	4.25–5.25
Nickel	79–81
Manganese	0.25–0.75
Silicon	0.10–0.20
Titanium	0.05–0.15
Iron	Balance

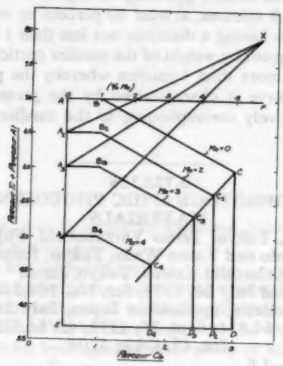
3,723,107
NICKEL-CHROMIUM-COBALT ALLOYS FOR USE AT RELATIVELY HIGH TEMPERATURES

Edward Gordon Richards, West Hagley, Paul Isidore Fontaine, Solihull, and Michael John Fleetwood, Berkhamsted, England, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,091
Claims priority, application Great Britain, Mar. 7, 1969, 12,261/69
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 **2 Claims**

Nickel-chromium-cobalt-base alloys containing correlated amounts of titanium, aluminum, columbium and,

when present, molybdenum, as well as carbon and other constituents offer a combination of high temperature stress-rupture strength, ductility and impact resistance



together with good corrosion resistance of such magnitude as to render the materials suitable for various gas turbine engine components.

3,723,108

NICKEL-CHROMIUM-COBALT ALLOYS

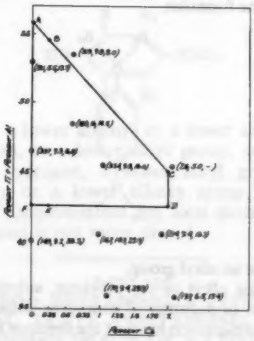
Peter Lindsay Twigg and Philip James Parry, Halesowen, England, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,367

Claims priority, application Great Britain, Mar. 7, 1969, 12,260/69

Int. Cl. C22c *19/00*

U.S. Cl. 75—171 **5 Claims**



Nickel-chromium-cobalt-base alloys containing correlated amounts of titanium, aluminum, columbium and molybdenum as well as carbon and other constituents offer a combination of high temperature stress-rupture strength, ductility and impact resistance together with good corrosion resistance of such magnitude as to render the materials suitable for various gas turbine engine components.

3,723,109

EXTRUSION OF CANNED METAL POWDERS USING GRAPHITE FOLLOWER BLOCK

Robert Lacock, and John Stanwood Benjamin, both of Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Filed July 16, 1971, Ser. No. 163,481

Int. Cl. B22f *3/20*

U.S. Cl. 75—214 **9 Claims**

In hot extruding a batch of dispersion-strengthened metal powder confined in a metal can through an extrusion die in which a uniformly high extrusion strain rate must be obtained, a graphite follower block of substantially the same diameter as the can is inserted between the end face of the extrusion ram and an end face of the heated can, the temperature of the block being at least substantially that of the canned powder, such that during extrusion, friction is markedly reduced by substantially inhibiting metal flashback from the can and the necessary high strain rate is obtained.

3,723,110

ELECTROPHOTOGRAPHIC PROCESS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 608,606, Dec. 19, 1966, now Patent No. 3,573,906. This application Dec. 21, 1970, Ser. No. 99,939

The portion of the term of the patent subsequent to Apr. 4, 1988, has been disclaimed

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 PC **9 Claims**

An electrophotographic plate and imaging process are disclosed. The plate comprises a conductive substrate coated with a thick organic insulating layer overcoated with a thin photoconductive layer. Images may be formed by electrostatically charging the plate, exposing it to an image and developing with electroscopic marking material.

3,723,111

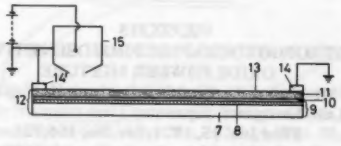
METHOD OF GROUNDING FOR AN ELECTRONIC PHOTOSENSITIVE PLATE

Motoki Kojima, Tokyo, Eturo Ochiai, Sagamihara, and Yoji Katayanagi, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

Filed Dec. 23, 1970, Ser. No. 101,032

Int. Cl. G03g *13/02, 15/02*

U.S. Cl. 96—1 C **3 Claims**



An improved method of grounding for an electronic photosensitive plate is disclosed. The method is characterized in that the surface of a photoconductive layer in said photosensitive plate comprising at least a conductive supporting base and the photoconductive layer, is partially grounded.

3,723,112

MANIFOLD IMAGING METHOD WHEREIN THE ACTIVATOR CARRIES A PLASTIC COATING MATERIAL

Ray H. Luebbe, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 675,989, Oct. 17, 1967, abandoned. This application July 10, 1970, Ser. No. 53,750

Int. Cl. G03g *13/22, 5/06*

U.S. Cl. 96—1.2 **13 Claims**

An imaging system wherein a structure comprising a cohesively weak imaging layer sandwiched between a donor sheet

and a receiver sheet is used. The imaging layer is activated with an activator comprising at least two components, one of the components being a plastic, the other being a partial solvent for the imaging layer. Upon separation of the receiver and donor sheets a durable, workable, plastic surface is obtained on the image. This surface may then be buffed providing a transparency which will project a true color image.

3,723,113

POLYCHROMATIC ELECTROSOLOGRAPHIC IMAGING PROCESS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 609,056, Jan. 13, 1967, abandoned. This application Nov. 9, 1970, Ser. No. 87,666
Int. Cl. G03g *13/04, 13/06, 13/22*
U.S. Cl. 96—1.2 14 Claims

A polychromatic migration imaging system is disclosed. Typically, a plate of a conductive substrate coated with a softenable insulating layer overcoated with a mixture of different colored photosensitive particles is electrostatically charged, and exposed to a polychromatic image. The softenable layer is softened, allowing selective migration of some particles to the substrate, resulting in a polychromatic image.

3,723,114

THERMOSETTING ELECTROSTATOGRAPHIC DEVELOPER OF A CARRIER AND PREPLOYMER OF DIALLYL PHTHALATE, ISOPHTHALATE AND MIXTURES

Robert J. Hagenbach, Rochester, and Robert W. Madrid, Macedon, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed Feb. 4, 1970, Ser. No. 8,710
Int. Cl. G03g *9/02*
U.S. Cl. 96—1.4 23 Claims

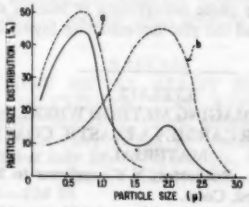
Electrostatographic developing powder (toner) comprised of a finely-divided colored resin a substantial portion of the resin being a solid, freeflowing and uncrosslinked thermosetting resin which is a polymer of diallyl phthalate, or a polymer of diallyl isophthalate, preferably a homopolymer of diallyl phthalate having a softening range of 80° to 105° C. or a homopolymer of diallyl isophthalate having a softening range of 55°–95° C. The use of this toner in conjunction with a carrier for the development of a latent electrostatic image produces a final copy having improved storage properties.

3,723,115

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE ZINC OXIDE POWDER MIXTURE

Hajime Miyatsuka, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1971, Ser. No. 106,721
Claims priority, application Japan, Jan. 16, 1970, 45/4330
Int. Cl. G03g *5/08*
U.S. Cl. 96—1.8 4 Claims



An electrophotographic member comprising a support layer and an electrophotographic photosensitive layer disposed on the support layer, the electrophotographic photosensitive layer comprising a powder mixture dispersed in an electrically insulative film forming binder material, the powder mixture being a mixture of larger zinc oxide particles and smaller zinc oxide particles, the ratio by weight of the larger particles to the smaller particles being within the range from 4 : 6 to 1 : 9, the larger particles having an average particle diameter of 1.2 microns and the smaller particles having an average particle diameter of 0.8 microns, at least 60 percent by weight of the larger particles having a diameter not less than 1 micron and at least 70 percent by weight of the smaller particles having a diameter not more than 1 micron whereby the particle size distribution curve is characterized by the presence of two peaks respectively corresponding to the smaller and larger particles.

3,723,116

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIALS

Kikuo Kinjo, Tokyo, Teruo Yamanouchi, Fujisawa, and Eiichi Kondo and Yasuo Wada, Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 20, 1971, Ser. No. 164,340
Claims priority, application Japan, July 24, 1970, 45/64,834; Sept. 25, 1970, 45/84,522
Int. Cl. G03g *5/04*
U.S. Cl. 96—1.6 6 Claims

A photosensitive material comprises a poly-9-vinylcarbazole or its derivative and a cyanine dye. The cyanine dye sensitizes the photosensitivity of poly-9-vinylcarbazole or its derivative and thereby the photosensitive material is suitable for electrophotography.

3,723,117

METHOD FOR DEVELOPING SILVER HALIDE EMULSIONS

Jozef Frans Willems, Wilrijk, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Oct. 7, 1970, Ser. No. 78,914
Claims priority, application Great Britain, Oct. 27, 1969, 52,565/69
Int. Cl. G03c *5/54, 5/30*
U.S. Cl. 96—29 10 Claims

A photographic developing method is described which comprises developing an exposed silver halide emulsion layer of a photographic material with an aqueous alkaline composition in the presence of a hydroxylamine developing agent and a p-phenylene diamine or p-aminophenol derivative corresponding to one of the formulas

wherein:

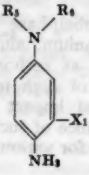
R_1 stands for an alkyl group,

R_2 stands for alkyl or for ethylene, substituted ethylene, propylene or substituted propylene attached to the adjacent ortho-carbon atom of the benzene ring,

R_3 stands for alkyl, and

R_4 stands for an alkyl group,

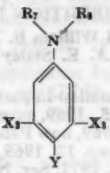
at most one of R_1 and R_4 being substituted alkyl;



wherein:

each of R_5 and R_6 stands for an alkyl group, and

X_1 stands for an electron-donating group; and



wherein:

each of X_2 and X_3 stands for hydrogen, halogen or an electron-donating group,

Y stands for OH or NH_2, and

R_7 stands for ethylene, substituted ethylene, propylene or substituted propylene attached to the adjacent ortho-carbon atom of the benzene ring, and

R_8 stands for hydrogen, an alkyl group or has the same significance as R_7, or

R_7 together with R_8 and the N-atom to which they are attached from a pyrrolidine ring.

The p-phenylene diamine or p-aminophenol derivative has a super-additive developing affect with the hydroxyl amine developing agent.

3,723,118

DIFFUSION TRANSFER PROCESS FOR PHOTOGRAPHIC SILVER HALIDE EMULSION

Haruhiko Iwano, Mitsugu Tanaka, Tetsuo Otsuki, and Atsuaki Arai, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

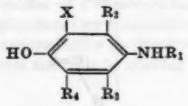
No Drawing. Filed June 8, 1971, Ser. No. 150,932

Claims priority, application Japan, June 8, 1970, 45/49,338

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 **12 Claims**

A high speed diffusion transfer process which comprises processing an exposed photographic silver halide material with a processing solution containing a compound represented by the following general formula or acid salt thereof:



wherein X is a lower alkenyl or a lower alkenoxy group, R_1 is hydrogen, or a lower alkyl group, and R_2, R_3 and R_4 each is hydrogen, a lower alkyl group, a lower alkenyl group or a lower alkoxy group, in which the term "lower" indicates that the total number of carbon atoms contained is not more than 4.

3,723,119

PROCESS FOR PREPARING A LITHOGRAPHIC PRINTING PLATE CONTAINING AN OLEOPHILIC DIMER IMAGE OF AN OXIDIZED SILVER HALIDE DEVELOPING AGENT

Toshiichi Yoshida, Takashi Nakamura, and Kinji Ohkubo, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

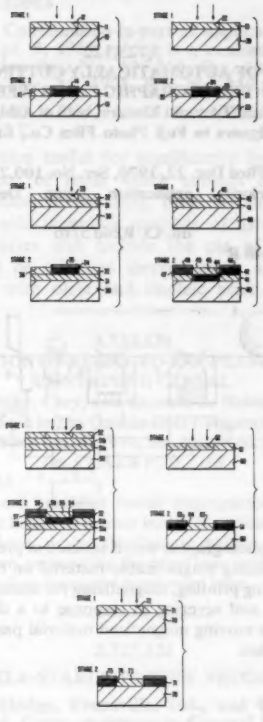
Continuation-in-part of abandoned application Ser. No. 660,366, Aug. 14, 1967. This application Feb. 24, 1971, Ser. No. 118,493

Claims priority, application Japan, Aug. 12, 1966, 41/52,937

Int. Cl. G03f *7/02*

U.S. Cl. 96—33 **13 Claims**

A lithographic printing plate and a method for its preparation comprising image wise exposing a silver halide emulsion layer whose surface is hydrophilic and developing said layer with a developing agent which forms an oleophilic dimer from its oxidation product to produce on



the layer an oleophilic dimer image receptive to greasy ink wherein the developing agent is incorporated in either or both the layer and processing solution.

3,723,120

PROCESS FOR HARDENING PHOTOHARDENABLE IMAGES

Karl Frederick Hummel, Robbinsville, N.J., assignor to E. I. du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 763,028, Sept. 26, 1968, abandoned. This application Aug. 30, 1971, Ser. No. 176,309

Int. Cl. G03c *5/14*

U.S. Cl. 96—35.1 **9 Claims**

Photographic images comprising photopolymerizable material on a base support are posthardened by immersing said images in a liquid medium that transmits actinic radiation and which is inert with respect to the photopolymerizable material, and exposing them to an intense source of actinic radiation for a short period.

3,723,121

PROCESS FOR RECORDING IMAGES WITH LASER BEAMS

William Paul Hauser, Cranbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 3, 1970, Ser. No. 86,588

Claims priority, application Switzerland, Nov. 1, 1969, 16,307/69

Int. Cl. G03c *5/04, 5/24*

U.S. Cl. 96—27 **8 Claims**

A process for laser beam recording by irradiating a layer of a thermochromic material chosen so that under ir-

radiation with a laser of a particular color the material is converted by absorption of incident laser radiation to a color which transmits the incident laser beam so that no further change takes place.

3,723,122

METHOD OF AUTOMATICALLY CUTTING ROLLED PHOTOGRAPHIC PAPER WEB

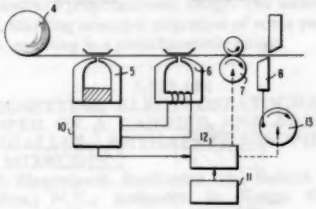
Akira Yano, and Tsutomu Kimura, both of Ashigara-Kamigun, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1970, Ser. No. 100,738

Claims priority, application Japan, Dec. 24, 1969, 44/104007

Int. Cl. B26d 5/36

U.S. Cl. 96—48 R 2 Claims



A running photographic web is severed at predetermined locations by placing magnetizable material on the rear side of the same during printing, magnetizing the material after photo development and severing in response to a detection signal caused by the moving magnetized material passing stationary detecting means.

3,723,123

MULTICOLOR REPRODUCTIONS

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, and Ser. No. 849,493, Aug. 12, 1969, now abandoned. This application Mar. 10, 1971, Ser. No. 123,083

Int. Cl. G03c 5/24; B05c 1/16

U.S. Cl. 96—48 46 Claims

The method of forming a multicolor reproduction which comprises: coating a substrate bearing a first color in image-wise configuration with a solid, light-sensitive organic layer having a thickness of at least 0.1 micron while maintaining said first color in its image-wise configuration, said light-sensitive organic layer being capable of developing a R_d of 0.2 to 2.2; exposing said light-sensitive organic layer to actinic radiation in image-receiving manner to establish a potential R_d of 0.2 to 2.2; applying to said layer of organic material, free flowing powder particles of a second color having a diameter, along at least one axis, of at least about 0.3 micron but less than 25 times the thickness of said organic layer; while the layer is at a temperature below the melting points of the powder and of the organic layer, embedding said powder particles as a monolayer in a stratum at the surface of said light-sensitive layer to yield an image having portions varying in density in proportion to the exposure of each portion; and removing non-embedded particles from said organic layer to develop a multicolor reproduction.

3,723,124

DYE IMBIBITION IMAGES

Rexford W. Jones and William B. Thompson, Columbus, Ohio, assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

No Drawing. Continuation-in-part of applications Ser. No. 796,897, Feb. 5, 1969, now abandoned, Ser. No. 833,771, June 16, 1969, now Patent No. 3,677,759, and Ser. No. 849,520, Aug. 12, 1969, now abandoned. This application Mar. 10, 1971, Ser. No. 123,085

Int. Cl. G03c 5/24; B05c 1/16

U.S. Cl. 96—48 42 Claims

The process for forming molecularly dispersed dye imbibition images of improved tonal qualities and handling properties which comprises (1) treating a substrate bearing a solid, organic layer holding a monolayer of powder particles in image-wise configuration, said powder particles comprising a dye, with vapors of a material which is a solvent for said dye and capable of swelling the surface of said substrate, molecularly imbibing said dye into said substrate, and (2) removing said solid, organic layer with a material which is a solvent for said solid, organic layer and a poor solvent for the surface of the substrate.

3,723,125

PROCESS FOR THE FORMATION OF COLOR PHOTOGRAPHIC IMAGES

Jun Hayashi, Reiichi Ohi, Tadao Shishido, and Tokiharu Kondo, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

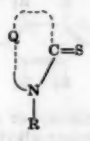
No Drawing. Filed Sept. 8, 1970, Ser. No. 70,555

Claims priority, application Japan, Sept. 5, 1969, 44/7,068; Apr. 2, 1970, 45/28,712

Int. Cl. G03c 7/00

U.S. Cl. 96—56.2 17 Claims

A process for the formation of color photographic images by processing a multi-layer type color photographic light-sensitive material having at least two silver halide emulsion layers on a support, which comprises developing said light-sensitive material in the presence of a compound having the following general Formula I



(I)

wherein Q represents an atomic group necessary to complete a heterocyclic ring which may be substituted, and wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, and a heterocyclic group, is disclosed.

3,723,126

PHOTOGRAPHIC DEVELOPERS WITH TITANOUS DIETHYLENETRIAMINEPENTAACETIC ACID

Harry J. Price, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,843

Int. Cl. G03c 5/38

U.S. Cl. 96—61 M 8 Claims

Certain titanium complex, silver halide developing agents in photographic diffusion transfer systems provide stable, developed images over a broad pH range. They can be employed in monobaths and in combination with various addenda, including other developing agents and silver halide solvents.

3,723,127

MULTILAYERED COLOR PHOTOGRAPHIC MATERIAL

Tetsuo Yano, Noboru Itoh, Sigeru Iguchi, Bunzo Ueda, and Eiji Kanada, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Inc., Tokyo, Japan

No Drawing. Filed July 30, 1970, Ser. No. 59,688

Claims priority, application Japan, Aug. 6, 1969, 44/62,156

Int. Cl. G03c *1/76*

U.S. Cl. 96—74 22 Claims

A multilayered color photographic material having increased viscosity and coagulation temperature at application and having excellent permeability of treating solution at development and providing good hard film after fixing can be obtained by incorporating a styrene/maleic anhydride copolymer and/or a condensation reaction product of said copolymer and polyvinyl alcohol in gelatin.

3,723,128

PHOTOGRAPHIC MATERIAL CONTAINING FILTER DYES

Eric MacDonald, Llanbrynmair, Wales, and Frederick Campbell, Manchester, both of England, assignors to Ilford Limited, Ilford, England

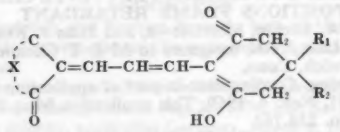
Filed June 2, 1971, Ser. No. 149,398

Claims priority, application Great Britain, June 3, 1970, 26,841/70

Int. Cl. G03c *1/84*

U.S. Cl. 96—84 R 4 Claims

This invention relates to new polymethinoxanol dye-stuffs. They correspond to the formula



(I)

wherein X is the residue of a heterocyclic ring system and R_1 and R_2 are hydrogen atoms or optionally substituted alkyl or aryl groups. They are useful for incorporation in photographic silver halide material and able to correct various deficiencies of such material.

3,723,129

BITE-SIZE BODY OF HAY

Richard W. Bushmeyer, Rockford, Ill., and Charles D. Miller, deceased, late of Rockford, Ill., by John Holmstrom, Jr., administrator, Rockford, Ill., assignors to J. I. Case Company

Continuation-in-part of application Ser. No. 770,900, Oct. 23, 1968, which is a continuation of application Ser. No. 638,665, May 15, 1967, which in turn is a continuation of application Ser. No. 236,742, Nov. 9, 1962, all now abandoned. This application May 27, 1970, Ser. No. 40,964

Int. Cl. A23k *1/00*

U.S. Cl. 99—2 1 Claim

A small or bite-size self-sustaining pellet of animal food in the form of a cylindrical continuous ribbon-like body of material which is spirally wound about the axis of the cylinder with the layers having a relatively higher density near the outer perimeter relative to the layers in the open center. The ribbon-like body of material is also helically wound about the axis of the cylinder.

3,723,130

FOOD ADDITIVE COMPOSITION OF SQUALENE, OLEYL ALCOHOL AND OLEIC AND LINOLEIC ACID

John L. Stephenson, 9004 Orange Hunt Lane, and Joseph V. Gaven, Jr., 8606 Canterbury Drive, both of Annandale, Va. 22003

No Drawing. Continuation-in-part of application Ser. No. 814,820, Apr. 9, 1969, which is a continuation-in-part of application Ser. No. 675,064, Oct. 13, 1967. This application Dec. 21, 1971, Ser. No. 210,551

Int. Cl. A23k *1/16, 1/10;* A23d *5/00*

U.S. Cl. 99—2 F 20 Claims

A composition useful for significantly improving animal acceptance of feeds which consists essentially of effective amounts of squalene, oleyl alcohol, oleic acid and linoleic acid including methods of using the same. Suitable additives also include the use of squalene or oleyl alcohol or mixtures thereof alone as well as in combination with oleic and linoleic acids.

3,723,131

PREPARATION OF READY-TO-EAT PEANUT BUTTER CONTAINING CEREAL

Douglas G. Bixby, Cary, and Kenneth L. Helmke, Elgih, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 6, 1970, Ser. No. 78,627

Int. Cl. A23l *1/10, 1/18*

U.S. Cl. 99—83 5 Claims

A ready-to-eat breakfast cereal impregnated with a non-heat-degraded liquefied peanut butter is produced by preparing a cereal base, drying the base to below 14 percent by weight moisture, permeating the dried base with liquid peanut butter, and further drying the permeated base.

3,723,132

SHELF-STABLE PASTRY PRODUCT

William V. Hodge, Evansville, Ind., and Charleston R. Lee, Bethel, Conn., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed Apr. 2, 1971, Ser. No. 130,809

Int. Cl. A21d *13/08*

U.S. Cl. 99—92 4 Claims

Fat-fried pastry product in which stalage is retarded when stored at room temperatures for periods of up to a year or more are prepared from a dough mix comprising a unique combination of flour, starch and stearyl-2-lactylate. The texture is improved to the point of freshness when the fried products are heated prior to consumption.

3,723,133

METHOD OF PREPARING A DEHYDRATED DEACIDIFIED CITRUS JUICE PRODUCT

Robert E. Berry and Charles J. Wagner, Jr., Winter Haven, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 7, 1972, Ser. No. 224,281

Int. Cl. A23l *1/02*

U.S. Cl. 99—105 1 Claim

A dehydrated deacidified citrus juice product and the method of preparing said product are disclosed. The method comprises processing citrus juices so as to obtain a low acid dehydrated product of relatively high Brix to acid ratio. The product is powdery, anhydrous, and is useful in blending with other products to lower acidity and improve quality.

3,723,134

PROCESS FOR MAKING CANDY FLOSS

Thomas E. Chivers, Osseo, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Division of Ser. No. 730,057, May 17, 1968, Pat. No. 3,557,717. This application Sept. 18, 1970, Ser. No. 73,667
Int. Cl. A23g 3/00, 3/02
U.S. Cl. 99—134 5 Claims

Process for making candy floss from a cooked slurry or syrup, containing sugar, salt, bicarbonate of soda and molasses, at least part of the sugar is brown sugar. Most of the moisture is removed from the slurry by cooking the slurry at a high temperature. A pressurized gaseous medium such as air, is used to diffuse the cooked candy as it is sprayed from a discharge opening, and convert it into floss form.

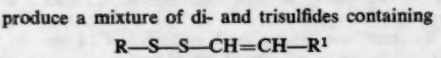
3,723,135

NOVEL FLAVOR COMPOUNDS AND PROCESS FOR PRODUCING AND UTILIZING THE SAME

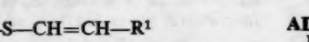
Michael H. Brodnitz, Matawan, and John V. Pascall, Old Bridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application Aug. 18, 1969, Ser. No. 851,067, now Patent No. 3,686,324. Divided and this application Aug. 30, 1971, Ser. No. 176,252
Int. Cl. A23l 1/26
U.S. Cl. 99—140 R 3 Claims

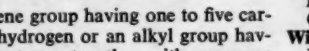
Novel processes for the production of alliaceous flavoring compositions comprising heating at least one thiosulfinate having the formula



to produce a mixture of di- and trisulfides containing



and



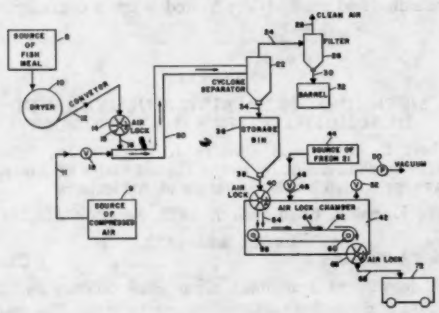
R being an alkyl or alkylene group having one to five carbon atoms and R^1 being hydrogen or an alkyl group having one to three carbon atoms, together with processes for preparing food compositions, and food and flavoring compositions so prepared.

3,723,136

PROCESS FOR KILLING SALMONELLA IN FISH MEAL

Thomas P. McConville, Long Beach, Calif., assignor to Westgate-California Foods, Inc., San Diego, Calif.

Filed Oct. 19, 1970, Ser. No. 81,670
Int. Cl. A23l 3/34; A22c 25/00
U.S. Cl. 99—158 10 Claims



A process for exposing fish meal to dichloromonofloromethane gas or Freon 21 gas to kill Salmonella.

3,723,137

METHOD OF FORMING A CONTINUOUS ADHERENT BATTER ON A FOODPIECE

Leonard G. Fischer, College Point, Monroe B. Sherain, Brooklyn, and Nancy A. Cornacchio, Bronx, N.Y., Bernard J. Entner, Nutley, N.J., and Ferdinand E. Pettinato, Bronx, N.Y., assignors to DCA Food Industries, Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 39,154, May 20, 1970. This application Nov. 22, 1971, Ser. No. 200,852
Int. Cl. A22c 18/00, 25/00; B65b 33/00
U.S. Cl. 99—166 5 Claims

Adherent, continuous coating compositions for fried and baked food products are formed from a combination of ingredients including at least 3 wt. percent gelatinized starch. The batter coatings are formed directly on the food piece by a novel method including the steps of wetting a bare food piece with a fluid, dipping the wet piece in the dry coating composition and immersing the coated piece in a fluid to form a dripless batter directly on the food piece.

3,723,138

STABILIZATION OF SILVERING SOLUTIONS

Helmut Franz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 9, 1971, Ser. No. 179,175
Int. Cl. C23c 3/02
U.S. Cl. 106—1 10 Claims

Electroless plating solutions containing silver cations, which heretofore have been plagued by limited pot life and by the precipitation of dark precipitates during use, are stabilized by the inclusion therein of a persulfate, particularly ammonium persulfate.

3,723,139

ADDING ANTIMONY OXIDE-ANTIMONATE COMPOSITIONS TO RENDER POLYVINYL CHLORIDE COMPOSITIONS FLAME RETARDANT

William A. Larkin, Morristown, and John J. Kostrowski, Budd Lake, N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Continuation-in-part of application Ser. No. 874,081, Nov. 4, 1969. This application Mar. 21, 1972, Ser. No. 236,761
Int. Cl. C09k 3/28
U.S. Cl. 260—45.75 R 14 Claims

This invention relates to an article of manufacture which is rendered resistant to burning and smoke formation by the addition of at least 1% by weight of a thermally unstable chlorine-containing material together with a flame retarding and smoke inhibiting amount of a composition comprising an unfused mixture of (1) 70% to 90% of an antimony oxide and (2) 10% to 30% of an antimonate selected from the group consisting of sodium antimonate, potassium antimonate, and magnesium antimonate and to the process for producing said article.

3,723,140

GLASS-CERAMICS CONTAINING POLLUCITE

George H. Beall, Big Flats, and Hermann L. Rittler, Horseheads, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Dec. 28, 1971, Ser. No. 212,952
Int. Cl. C03c 3/22
U.S. Cl. 106—39.6 2 Claims

The instant invention relates to the production of opaque glass-ceramic articles having compositions within the Cs_2O-Al_2O_3-SiO_2 field wherein the crystal phase present consists essentially of pollucite solid solution with, frequently, a minor amount of mullite. The articles exhibit extreme refractoriness, e.g., certain bodies demonstrate excellent dimensional stability to temperatures up to 1550° C. This high refractoriness, coupled with chemical inertness to molten metal, has led to the use of these materials as preform cores in the making of hollow metal

castings, such as jet engine blades and vanes which require the use of very high temperature alloys such as the so-called super alloys of nickel and cobalt base.

3,723,141
INFRARED TRANSMISSIVE LEAD BISMUTHATE GLASSES
William H. Dumbaugh, Jr., 6 E. Chatfield Place, Painted Post, N.Y. 14870
Filed Mar. 22, 1971, Ser. No. 126,798
Int. Cl. C03c 3/00
U.S. Cl. 106—47 R 4 Claims

A combination of barium and zinc oxides is used to stabilize infrared transmitting lead bismuthate glasses. The resulting glasses contain 10–85% Bi_2O_3, 10–75% PbO, 2–25% BaO, 1–10% ZnO and 0–20% of miscellaneous other oxides.

3,723,142
NEUTRAL GRAY GLASS
Shigeki Kato and Takeshi Yamamoto, Yokohama, Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan
Filed Dec. 11, 1970, Ser. No. 97,139
Claims priority, application Japan, Dec. 11, 1969, 44/99,056
Int. Cl. C03c 3/06, 1/10, 3/30
U.S. Cl. 106—52 3 Claims

A neutral gray colored heat absorbing glass having a low excitation purity consists essentially of the following base components in percent by weight: 68 to 75% SiO_2, 0 to 5% Al_2O_3, 5 to 15% CaO, 0 to 10% MgO (6 to 15% CaO+MgO), 10 to 18% Na_2O, 0 to 5% K_2O (10 to 20% Na_2O+K_2O) together with coloring components of 0.1 to 0.5% Fe_2O_3, 0.003 to 0.02% CoO, 0.0005 to 0.001% Se, and negligible NiO.

3,723,143
GLASS COMPOSITIONS FOR ULTRASONIC DELAYED ACTION LINES
Marga Faulstich, and Norbert Neuroth, both of Mainz, Germany, assignors to Jenaer Glaswerk Schott & Genn, Mainz, Germany
Continuation-in-part of Ser. No. 804,595, March 5, 1969, abandoned. This application Aug. 26, 1971, Ser. No. 175,340
Claims priority, application Germany, March 8, 1968, P 16 96 064.8
Int. Cl. C03c 3/10, 3/04; H03h 7/30
U.S. Cl. 106—53 5 Claims

Glass compositions for ultrasonic delayed action lines characterized by low temperature coefficient of the ultrasonic travel time and by low internal attenuation of sound waves and transformation temperatures of between 550° and 620° having the following composition:

SiO_2	54.4–59.8 wt-%
B_2O_3	0 – 3 wt-%
K_2O	7.3–13.0 wt-%
BaO	12.0–19.3 wt-%
ZnO	6.7– 8.7 wt-%
PbO	0–15.7
TiO_2	0–2
Al_2O_3	0–3
Sb_2O_3	0–2
As_2O_3	0–2
WO_3	0–3 —;

3,723,144
BOROSILICATE OPAL GLASSES
James E. Flannery, Corning, N.Y., and Jacques G. Lemoine, Fontainebleau, France, assignors to Corning Glass Works, Corning, N.Y.
Filed May 10, 1971, Ser. No. 141,765
Int. Cl. C03c 3/08
U.S. Cl. 106—54 2 Claims

This invention relates to the production of borosilicate opal glasses wherein the opal phase is readily attacked by water and detergents. In the glasses of the present invention, the opal phase is made discontinuous, i.e., the particles thereof commonly exhibit a spherical configuration, such that deep leaching is inhibited. The glasses consist essentially, in weight percent on the oxide basis, of 0.5–2.5% Li_2O, 7–10% ZnO, 11–14% B_2O_3, and 71–76% SiO_2.

3,723,145
WELL CEMENTING COMPOSITIONS AND METHOD
Walter J. Haldas and Jesse A. Faust, Houston, Tex., assignors to Lone Star Cement Corporation, Houston, Tex.
No Drawing. Filed Apr. 5, 1971, Ser. No. 131,514
Int. Cl. C04b 7/02
U.S. Cl. 106—90 15 Claims

An additive composition for enhancing the properties of cement compositions, and cement composition of enhanced properties, particularly useful in the cementing of wells, and methods of cementing geologic formations traversed by well bores are disclosed. The additive composition comprises a water soluble lignosulfonate or lignosulfonic acid or mixtures thereof, tartaric acid or a salt of tartaric acid or mixtures thereof and sodium naphthalene sulfonate, and preferably about 3 parts calcium lignosulfonate, one part tartaric acid and four parts sodium naphthalene sulfonate, although good results are obtained with 1 to 19 parts lignosulfonate or lignosulfonic acid and 19 to 1 parts tartaric acid or a salt of tartaric acid admixed with 1 to 19 parts of sodium naphthalene sulfonate. The cement composition includes a hydraulic cement and preferably about 2% of the additive composition based on the weight of the cement; although, good results are obtained with from about 0.30% to about 5.00%. Especially good results are obtained when the hydraulic cement has been pretreated and aged as in our copending application filed Jan. 25, 1971, Ser. No. 109,606. The cement composition has good initial viscosity and strength, ideal thickening times, and a reduced amount of mix water may be used thereby increasing the weight of the cement slurry to about eighteen pounds per gallon without using weight materials.

3,723,146
RETARDED GYPSUM PLASTER FOR USE IN LONG SET AGGREGATE MORTAR APPLICATIONS
Marvin K. Lane, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.
No Drawing. Original application Apr. 1, 1969, Ser. No. 812,371, now Patent No. 3,652,309. Divided and this application Aug. 12, 1971, Ser. No. 171,379
Int. Cl. C04b 11/00
U.S. Cl. 106—110 2 Claims

The process of making a gypsum plaster possessing a high degree of stability over extended periods of time and having a set time of at least 4 hours in aggregated mortar application by providing a specially sized calcined gypsum having a particle size that is essentially all finer than 32 microns, and mixing said specially sized gypsum with retarder, accelerator and other additives to give the desired properties when mixed with water and aggregate.

3,723,147
STABILIZER SYSTEM FOR CELLULOSE ESTER PLASTICS
Edwin L. Wood, Kingsport, and Roger E. Gibson, Jonesboro, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 878,923, Nov. 21, 1969. This application Nov. 3, 1971, Ser. No. 195,446
Int. Cl. C08b 27/62
U.S. Cl. 106—176 2 Claims

Cellulose ester plastics useful as moldings, sheets, films, and other formed articles, of cellulose acetate, cellulose

butyrate, cellulose propionate, and co-esters thereof, have markedly improved heat stability in regard to color and inherent viscosity when stabilized with combinations of certain sulfides, particularly di-tridecyl-3,3'-thiodipropionate, and certain epoxides, particularly resorcinol bisglycidyl ether, each in a concentration of from about 0.01 to about 10.0 parts by weight per 100 parts by weight of the cellulose ester.

3,723,148

PROCESS FOR RECOVERING COATING MATERIALS

George L. Tupper, St. Clair Shores, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Continuation of abandoned application Ser. No. 798,169, Feb. 10, 1969. This application Mar. 15, 1971, Ser. No. 124,435

Int. Cl. B05c 11/10

U.S. Cl. 106—287 PR **3 Claims**

A process for deactivating or "killing" the overspray particles of a paint or similar coating material which comprise contacting the material with an aqueous alkaline solution which contains an organic nitrogen compound of the formula:

wherein R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkanol and hydroxy ether groups, which latter groups contains from about 2 to 10 carbon atoms, at least one of R_1, R_2 and R_3 being other than hydrogen, the organic nitrogen compound having a boiling point of at least about 100 degrees C. and a molecular weight which is not substantially in excess of about 500. Preferably, the alkaline solution is an aqueous solution of sodium hydroxide and/or sodium silicate and the preferred organic nitrogen compound is triethanol amine.

3,723,149

TREATMENT OF TITANIUM DIOXIDES

Colin Francs Cole, and Stanley Powell, both of Stockton-on-Tees, England, assignors to British Titan Limited, Billingham, Teesside, England

Filed March 18, 1971, Ser. No. 125,881

Claims priority, application Great Britain, March 21, 1970, 13,780/70

Int. Cl. C09c 1/36

U.S. Cl. 106—300 **9 Claims**

A process for the neutralization of pyrogenic titanium dioxide in which the dioxide is treated with steam at a temperature not exceeding 300°C in order that the majority of the acidity of the pigment may be removed and with a vapor of an organic amine to enable the neutralization process.

3,723,150

SURFACE MODIFICATION OF CARBON FIBERS

Melvin L. Druin, West Orange, George R. Ferment, Dover, and Velliyur N. P. Rao, North Plainfield, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,456

Int. Cl. C08h 17/08, 17/10

U.S. Cl. 106—307 **4 Claims**

A continuous process is provided for modifying the surface characteristics of a carbonaceous fibrous material (either amorphous carbon or graphitic carbon) and to thereby facilitate enhanced adhesion between the fibrous material and a matrix material. The fibrous material is continuously passed through a heating zone containing gaseous carbon dioxide under conditions found suitable for bringing about the desired surface modification. Composite articles of enhanced interlaminar shear strength may be formed by incorporating the fibers modified in accordance with the present process in a resinous matrix material.

3,723,151

DISPERSING AGENTS

Margaret Peddie Backhouse, South Ascot, Arthur Topham, Middleton, and Bernard Tury, Kemptown, England, assignors to Imperial Chemical Industries Limited, London, England

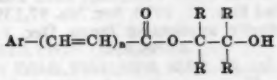
No Drawing. Filed Aug. 20, 1971, Ser. No. 173,628

Claims priority, application Great Britain, Sept. 7, 1970, 42,760/70; Nov. 13, 1970, 54,130/70

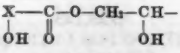
Int. Cl. C08h 17/02

U.S. Cl. 106—308 Q **4 Claims**

A dispersant comprising the reaction product of (a) a compound of the formula:



wherein Ar is an aromatic group, *n* is 0 or 1, from 2 to 3 R groups are individually hydrogen, methyl and ethyl and the remaining R group or groups individually or the remaining group R—C—C—R in combination provides a solvatable chain-like component of at least 12 links, or (b) an addition polymer compound which is solvated by an organic liquid and which contain at least one group of the formula:



wherein X is an aliphatic radical which optionally contains an additional hydroxy group or groups, with an organic monoisocyanate or with an organic diisocyanate which has already been or is simultaneously or subsequently reacted with an alcohol or amine so that in effect it behaves as a monoisocyanate and the use of the said dispersant for preparing dispersions of solids in organic liquids.

3,723,152

DRYING OIL COMPOSITIONS, COBALT DRIER COMPOSITIONS THEREFOR AND PROCESS OF MAKING SAME

Anthony Alkaitis, Cleveland Heights, and Gordon A. Thomas, Rocky River, Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

No Drawing. Continuation of abandoned application Ser. No. 566,761, July 21, 1966. This application Nov. 27, 1970, Ser. No. 93,388

Int. Cl. C09f 9/00

U.S. Cl. 106—310 **10 Claims**

Basic cobalt salts of neodecanoic acid have a stoichiometric excess of cobalt relative to that acid, as compared with neutral cobaltous salt of the acid, and are oil-soluble. Thus they are useful with hydrocarbon diluent as drier compositions and in drying oil compositions. The drier compositions can contain a high cobalt content, e.g., 12% cobalt by weight of the drier compositions. These salts have an amount of metal such that the sum of the stoichiometric amount of the metal and the excess corresponds to at least about 115% of the amount for neutralization of the acid by cobalt metal. The process used to make such salt reacts an excess of the metal with the acid in the presence of water and oxygen-containing gas for a time longer than required to neutralize the acid with metal. Then water is removed.

3,723,153

PROCESS FOR THE PRODUCTION OF A POWDERY COLORING AGENT AND PELLETS OF POLYALKYLENE RESIN COVERED THEREWITH

Yoshiaki Nagata, Suita, Yatuhiro Higo, Settsu, Satoshi Hirabayashi, Hyoto, and Eiichi Morozumi, Ibaragi, Japan, assignors to Dainippon Ink and Chemicals, Incorporated, Tokyo, Japan

Continuation of abandoned application Ser. No. 844,146, July 23, 1969. This application Nov. 20, 1970, Ser. No. 91,554

Claims priority, application Japan, July 24, 1968, 43/51,835; July 31, 1968, 43/53,609

Int. Cl. B44d *1/94*

U.S. Cl. 117—21 1 Claim

A coloring agent for a polyalkylene is obtained by uniformly mixing an antistatic agent with a mixture of a low molecular weight polyalkylene and a pigment. When said coloring agent is blended with pellets of a polyalkylene, the surfaces of the pellets are uniformly covered with said coloring agent and colored pellets of a polyalkylene are obtained.

3,723,154

PHOTOGRAPHIC ELEMENTS CONTAINING COMPOUNDS DERIVED FROM CYANOMETHYL SULFONES

Gene L. Oliver, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 21, 1971, Ser. No. 155,294

Int. Cl. G03c *1/84*

U.S. Cl. 117—33.3 12 Claims

Merocyanine dyes derived from certain cyanomethylsulfone compounds are useful as ultraviolet filter dyes, especially for photographic elements. 2,2'-bis-{[3-(3-sulfopropyl) - 2 - thiazolidinylidene]ethylidene}-2,2'-decamethylenedisulfonyl)diacetonitrile, disodium salt and tetramethylene bis{11 - {3-[3-(3-sulfopropyl)-2-thiazolidinylidene]-1 - cyanopropenylsulfonyl}undecanoate}, disodium salt are illustrative of the filter dyes of the invention.

3,723,155

WET CHEMICAL METHOD OF PRODUCING TRANSPARENT METAL FILMS

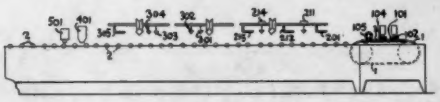
Charles B. Greenberg, Turtle Creek, and Roy G. Crissman, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 23, 1970, Ser. No. 57,527

Int. Cl. B32b *17/06;* B44d *1/08;* C03c *17/10*

U.S. Cl. 117—35 S 19 Claims

This invention relates to wet chemical methods of providing non-conductive transparent substrates with a transparent coating having a metallic luster and good uniformity. Especially valuable transparent substrates are provided in which the contemplated coatings are certain boron containing metal films. Transparent articles having especially attractive neutral colored films of nickel have been provided. Other articles having films of cobalt and/or iron have also been provided.



As one embodiment, this invention relates to the formation of extremely uniform transparent metal-boron films, such as nickel-boron, cobalt-boron, iron-boron or mixtures thereof on transparent plates of glass. These films may be produced by certain essential steps involving: activating a glass substrate in a conventional manner, i.e., by contacting the glass with a dilute aqueous solution of a stannous salt to sensitize said glass; thereafter contacting said glass with an aqueous palladium salt to further activate said glass; and then spraying two aqueous alkaline solutions—one containing a chelated metal salt and the other containing a borohydride reducing agent—onto said activated glass to form a transparent metal and boron containing film by reduction of the metal salt. Transparent viewing closures which exhibit a controlled transmittance and reflectivity (within limits specified herein), which are substantially free from localized deviations that are visible to the eye, and which reflect a large percentage of the solar radiation impinged thereon are produced in this manner.

3,723,156

RECORD MATERIAL

Bruce W. Brockett and Robert E. Miller, Dayton, and Mary L. Hinkle, Middletown, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed June 14, 1971, Ser. No. 153,079

Int. Cl. B41m *5/10*

U.S. Cl. 117—36.2 8 Claims

Sensitized record sheet material, suitable for developing useful color in oily, colorless, chromogenic dye-precursor inks applied thereto. Said record sheet material has a coating comprising an oil-soluble metal salt and an oil-soluble phenol-formaldehyde novolak resin.

3,723,157

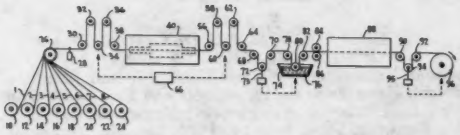
PRODUCTION OF RESIN IMPREGNATED FIBROUS GRAPHITE RIBBONS

Melvin Druin, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 7, 1969, Ser. No. 874,731

Int. Cl. C01b *31/04*

U.S. Cl. 117—46 CB 24 Claims



A process is provided wherein resin impregnated graphite ribbons may be efficiently produced which may be used in the manufacture of fiber reinforced composite structures. A plurality of multifilament bundles of a fibrous material capable of undergoing graphitization are continuously passed through a

graphitization zone from which they are continuously conveyed to and through a coating zone in which they are impregnated with a thermosetting resin. Throughout the continuous process of the invention, the multifilament bundles are provided in an essentially parallel relationship in the form of a ribbon and are continuously passed in the direction of their length. The ribbon product of the invention is particularly suited for use in the formation of strong lightweight composites by filament winding, or other composite forming techniques.

3,723,158

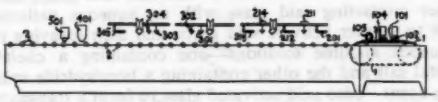
TRANSPARENT METAL FILMS AND WET CHEMICAL METHOD OF PRODUCING THE SAME

Richard G. Miller, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 829,755, June 2, 1969, now Patent No. 3,672,939. This application July 23, 1970, Ser. No. 57,451

Int. Cl. B44d *1/08;* **C03c** *17/10*

U.S. Cl. 117—47 A **24 Claims**



This invention relates to wet chemical methods of providing nonconductive transparent substrates with a transparent coating having a metallic luster and good uniformity. Especially valuable transparent substrates are provided in which the contemplated coatings are certain boron containing metal films. Transparent articles having especially attractive neutral colored films of nickel have been provided. Other articles having films of cobalt and/or iron have also been provided.

As one embodiment, this invention relates to the formation of extremely uniform transparent metal-boron films, such as nickel-boron, cobalt-boron, iron-boron or mixtures thereof on transparent plates of glass. These films may be produced by certain essential steps involving: activating a glass substrate in a conventional manner, e.g., by contacting the glass with a dilute aqueous solution of a stannous salt to sensitize said glass; thereafter contacting said glass with an aqueous palladium salt to further activate said glass; and then spraying two aqueous alkaline solutions—one containing a chelated metal salt and the other containing a borohydride reducing agent—onto said activated glass to form a transparent metal and boron containing film by reduction of the metal salt. Transparent viewing closures which exhibit a controlled transmittance and reflectivity (within limits specified herein), which are substantially free from localized deviations that are visible to the eye, and which reflect a large percentage of the solar radiation impinged thereon are produced in this manner.

3,723,159

METHOD FOR THE PRODUCTION OF A PHOTOGRAPHIC ELEMENT

Sumitaka Tatsuta and Wataru Ueno, Minami Ashigaramachi, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Kanagawa, Japan

No Drawing. Filed Jan. 14, 1971, Ser. No. 106,595

Claims priority, application Japan, Jan. 14, 1970, 45/4,163

Int. Cl. G03c *1/78*

U.S. Cl. 117—47 A **12 Claims**

A method for the production of a photographic element which comprises ozone-oxidizing a roughened, biaxially stretched polystyrene film and applying thereon a suspension containing gelatin as the binder, and photographic element thus formed.

3,723,160

ZINC-PLATING COMPOSITIONS

Jun Tanaka, Toshihiko Taguchi, and Mikio Watanabe, Tokyo, Japan, assignors to Senju Metal Industry Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1970, Ser. No. 78,798

Claims priority, application Japan, Oct. 22, 1969, 44/83,875

Int. Cl. B44d *1/34;* **C23c** *5/00*

U.S. Cl. 117—50 **3 Claims**

A novel zinc-plating composition comprising zinc powder and a flux consisting of a formamide and/or acetamide medium and zinc chloride, ammonium chloride, stannous chloride and lead chloride is provided. This composition gives good zinc plating on the surface of steel materials by simply being applied to the surface and heated. Up to 1% aluminum may be added to said zinc powder. Aluminum prevents growth of the zinc-ion alloy layer. Also a primary flux solution consisting of zinc chloride, ammonium chloride, stannous chloride, hydrochloric acid and water is provided, which is used for pretreating the surface to be zinc-plating for activation thereof. Use of these compositions makes possible zinc plating of large size steel materials and structures including ship bottoms.

3,723,161

PROCESS AND APPARATUS FOR THE PRODUCTION OF SYNTHETIC LEATHER

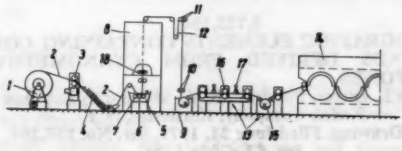
Heinz Fleissner, Egelsbach, Germany, assignor to Vepa AG, Basel/Schweiz, Switzerland

Filed July 31, 1970, Ser. No. 59,877

Claims priority, application Germany, July 31, 1969, P 19 38 966.3; Aug. 12, 1969, P 19 40 954.2; Nov. 5, 1969, P 19 55 653.7; March 2, 1970, P 20 09 662.2

Int. Cl. B44d *1/092*

U.S. Cl. 117—66 **20 Claims**



An apparatus and method for producing synthetic leather comprising the manipulative steps of impregnating, drying and coagulating, shrinking, washing and finally drying a fiberous web.

3,723,162

PRETREATMENT OF METAL SURFACES

Lambis Leontaritis, Cologne; Nikolaus Schon, Leverkusen, and Hans Hoffmann, Leichlingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 14, 1970, Ser. No. 98,104

Claims priority, application Germany, Dec. 30, 1969, P 19 65 586.8

Int. Cl. C23f *11/00*

U.S. Cl. 117—71 M **9 Claims**

Sheet metal whose surfaces have been freshly prepared chemically as by pickling and/or nickel coating, is covered with a coating of a water-soluble polyphosphate which may include an emulsifier and/or a water-soluble organic polymer,

preferably film-forming. The coating protects the fresh surface during storage and/or shaping and the metal may thereafter be enamelled either with or without prior removal of the polyphosphate coating.

3,723,163
PROCESS FOR SEALING A SURFACE AND RESULTANT SURFACE

Gerald F. Schumacher, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of abandoned application Ser. No. 814,754, Apr. 9, 1969. This application May 28, 1971, Ser. No. 147,875
Int. Cl. B32b *13/12*; B44d *1/14*
U.S. Cl. 117—72 **16 Claims**

A process for sealing concrete by providing a composite of two layers, one layer being capable of bridging cracks in the cement even during extreme temperature variations, and the other layer being tough and abrasion- and wear-resistant, both layers comprising a urethane polymer resulting from in situ curing of evenly applied, separate coatings of moisture curable, isocyanate terminated prepolymer.

3,723,164
MOTTLE PREVENTING TREATMENT FOR PAPERBOARD

Joseph Marton and Terezia Marton, Silver Spring, Md., assignors to Westvaco Corporation, New York, N.Y.

No Drawing. Filed Apr. 29, 1971, Ser. No. 138,809
Int. Cl. B44d *1/14*
U.S. Cl. 117—76 P **4 Claims**

Paper and paperboard, for use in packaging detergents containing a persalt such as sodium perborate, are treated with a water-soluble inorganic alkali salt such as sodium nitrite and a buffering agent selected from the group consisting of calcium carbonate, magnesium carbonate and sodium silicate, to stabilize the sodium nitrite in the paperboard, and prevent the paper and paperboard from becoming mottled in the presence of the perborate containing detergent under extremely adverse climatic conditions due to oxidative degradation of carbohydrate and protein materials in and on the paper or paperboard.

3,723,165
MIXED METAL AND HIGH-TEMPERATURE PLASTIC FLAME SPRAY POWDER AND METHOD OF FLAME SPRAYING SAME

Frank N. Longo, East Northport, L.I., and George J. Durmann, Farmingdale, L.I., both of N.Y., assignors to Metco, Inc., Westbury, L.I., N.Y.

Continuation-in-part of Ser. No. 16,247, March 3, 1970, abandoned. This application Oct. 4, 1971, Ser. No. 186,492
Int. Cl. B44d *1/097*; B05b *7/22*
U.S. Cl. 117—93.1 PF **14 Claims**

The flame spraying of high temperature plastic powder as for example polyimides, polyamide-polyimides, polyester imides, or aromatic polyester high temperature plastics in admixture with a flame spray metal powder as for example aluminum alloy, nickel, copper, bronze, babbitt or stainless steel flame spray powder.

3,723,166
UNSATURATED GRADED-RUBBER AND VINYL MONOMER PAINT

Olin B. Johnson, 27406 Vargo, Livonia, Mich. 48152, and Santokh S. Labana, 657 Cronin Drive, Dearborn Heights, Mich. 48127

No Drawing. Filed Dec. 21, 1970, Ser. No. 100,390
Int. Cl. C08g *45/04*
U.S. Cl. 117—93.31 **10 Claims**

A radiation-curable paint which on a pigment and particulate filler-free basis consists essentially of vinyl monomers and particulate graded-rubber having alpha-beta olefinic-unsaturation surface functionality. The coating is applied as a film-forming dispersion to the surface of a substrate and cured thereon by ionizing radiation, e.g., an electron beam. This application is further directed to articles of manufacture coated with this paint using this process of curing.

3,723,167
ACRYLATE-ESTER-SILOXANE-ESTER-ACRYLATE PAINT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Continuation-in-part of abandoned applications Ser. No. 888,054 and Ser. No. 888,059, both Dec. 24, 1969. This application Oct. 1, 1971, Ser. No. 185,846
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 **18 Claims**

A novel siloxane-ester-acrylate paint binder resin that is crosslinkable with vinyl monomers by exposure to an electron beam is produced in a three step reaction. These resins may be produced by the process wherein (1) a hydroxy acrylate selected from C_5–C_{12} monohydroxy acrylates which are esters of a C_2–C_8 diol and acrylic or methacrylic acid is reacted with a C_4–C_{10} anhydride of a dicarboxylic acid, (2) the organic reaction product of the first reaction step is reacted with a C_2–C_{21} diol, and (3) the organic reaction product of the second reaction step is reacted with a siloxane having two or more hydroxy or alkoxy functional groups per molecule. A second method for producing these resins also involves a three step reaction wherein (1) a siloxane having two or more hydroxy or alkoxy functional groups per molecule is reacted with a C_2–C_{21} diol, (2) the siloxane-comprising reaction product of the first reaction step is reacted with a C_4–C_{36} dicarboxylic acid or anhydride thereof, and (3) the siloxane-comprising reaction product of the second reaction step is reacted with either glycidyl acrylate, glycidyl methacrylate, or a C_5–C_{12} monohydroxy acrylate which is the ester of a C_2–C_8 diol and acrylic or methacrylic acid.

3,723,168
METHOD OF PRODUCING LAMINATED PLASTIC FOIL TUBING

Kastulus Utz, Freising, and Heinrich Antholzner, Socking, Germany, assignors to Multifoil Patentverwertungs AG, Chur, Switzerland

Filed Jan. 27, 1971, Ser. No. 110,072
Int. Cl. B44d *1/02*
U.S. Cl. 117—94 **9 Claims**

A laminated plastic foil tube having an inner polyethylene layer and an outer nylon layer is passed through an aqueous suspension of vinylidene chloride homopolymer or copolymer while in the flattened condition, thereafter inflated, and the aqueous coating is dried at a temperature high enough to make the polyethylene tacky. The deposited polyvinylidene is sintered at an even higher temperature to make it homogeneous and free from

pores, and the coated tube is cooled, deflated, and stored in the flattened condition. The triple plastic layer is im-

pervious to water vapor and other vapors, grease, and oxygen, and suitable as a wrapper for food and the like.

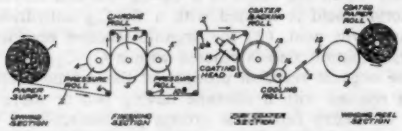
3,723,169
PROCESS OF COATING PAPER

Samuel L. Guastella, Westminster, Mass., and Jerry J. Larrivee, Jr., Gorham, Maine, assignors to Blandin Paper Company, Grand Rapids, Minn.

Continuation-in-part of application Ser. No. 866,766, Oct. 15, 1969. This application Jan. 12, 1970, Ser. No. 1,995

Int. Cl. B44d *1/02*

U.S. Cl. 117—111 H **8 Claims**



The process of coating a paper base with a hot melt coating composition which is comprised of at least 50 weight percent of a coating pigment or a mixture thereof dispersed in an undiluted, heat extrudable binder (e.g., a normally solid thermoplastic resin), said binder comprising less than 50 weight percent of the total weight of the coating composition. For example, a publication paper is prepared by coating an uncoated, prefinished, ground wood paper on both sides with a coating composition that comprises a normally solid ethylene polymer or copolymer and a clay pigment wherein the amount of pigment is greater than 50% by weight of said coating. The total coating weight (both sides) is less than 15 grams per square meter (gms./m.^{2}).

3,723,170
PRESSURE-SENSITIVE ADHESIVE TAPE

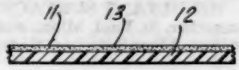
Ralf Korpman, East Brunswick, N.J., assignor to Johnson & Johnson

Filed Dec. 5, 1969, Ser. No. 882,570

Int. Cl. C09j *7/02*

U.S. Cl. 117—122 P **7 Claims**

A pressure-sensitive adhesive tape with improved properties at elevated temperatures within the range of about 212°–280° F. This tape is based on an adhesive wherein a major proportion by weight of the elastomers is an elastomeric and thermoplastic block polymer of the structure ABA, wherein A is a thermoplastic polymer block of styrene possessing a number average molecular weight of about 12,000–30,000, and B is an elastomeric



polymer block of isoprene possessing a number average molecular weight of at least about 100,000, and wherein the styrene A blocks compose about 10–35 percent by weight of the block polymer.

3,723,171
PROCESS FOR THE MANUFACTURE OF PVF SHAPED ARTICLES

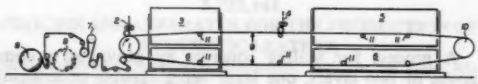
Otto Fuchs, Holsteinstr. 44, 521 Troisdorf-Oberlar, Germany

Filed Sept. 15, 1970, Ser. No. 72,475

Claims priority, application Germany, Sept. 15, 1969, P 19 46 611.6

Int. Cl. C09j *7/02*

U.S. Cl. 117—122 PF **12 Claims**



Improvements in adhering polyvinyl fluoride sheets to other materials by making a novel sheet composed of polyvinyl fluoride in sheet form and a layer of adhesive, preferably a polyurethane adhesive, on an appropriate surface, or portion of a surface of the polyvinyl fluoride sheet. This composite adhesive sheet must be made in a special way by coating a solution or dispersion of the polyvinyl fluoride onto a suitable surface, removing the solvent or dispersing medium to a residual content of about 0.4 to 0.8 weight percent, applying the adhesive, preferably as a solution or dispersion, in the area required, and then removing the remainder of the solvent or dispersant from both the polyvinyl fluoride sheet and the adhesive layer.

3,723,172
CHEMICAL AND THERMAL STABILITIES AND FIRE RESISTANCE OF SYNTHETIC RESINOUS BODIES

Roshdy Ismail, Neunkirchen, Germany, assignor to Dynamit Nobel AG, Troisdorf, Germany

Filed Sept. 18, 1970, Ser. No. 73,672

Claims priority, application Germany, Sept. 20, 1969, P 19 47 807.0

Int. Cl. B44d *1/09*; **B32b** *27/08*

U.S. Cl. 117—138.8 A **10 Claims**

Synthetic resinous bodies especially in sheet form, such as plates, foils, webs and non-wovens, have their chemical and thermal stabilities and their fire resistance improved by application thereto of a polyester of an aromatic dicarboxylic acid, such as terephthalic acid optionally admixed with isophthalic acid, and a halogenated dihydric phenol which may be mixed with up to an equal mole percent of a halogen-free dihydric phenol. The synthetic resinous material may be a crude preform wrapped in a sheet of the polyester and formed into final shape with heat and pressure and, optionally, curing. An epoxy resin or polyurethane adhesive may help bond the synthetic resinous material to the polyester sheet.

The synthetic resinous body may comprise a polyamide, polycarbonate, polyvinylchloride, polystyrene or polyester.

3,723,173

METHOD OF TREATING TEXTILE FIBERS PRIOR TO FORMING THEM INTO YARN

Nikolaus Augustin Schonfeldt, Molndal, Sweden, assignor to MK Research and Development Co.

No Drawing. Filed Apr. 23, 1970, Ser. No. 31,360
Int. Cl. C09k *3/16;* C10m *3/14, 3/26*
U.S. Cl. 117—139.5 CQ 19 Claims

A process for treating fibers before carding and combing to form yarn to provide increased strength and elongation of the fibers and to reduce the buildup of static electricity during handling is provide which comprises applying to the fibers a reaction product which is obtained from a compound having an alkyl group containing from 2 to 22 carbon atoms at least one nitrogen atom and at least one reactive hydrogen atom, and from two alkylene oxides, one being ethylene oxide containing two carbon atoms, and the other having at least three carbon atoms in the molecule.

3,723,174

PIGMENT FOR PRESSURE SENSITIVE RECORD MATERIAL

David B. Swanson, Cranford, and Barry S. Miller, Roselle, both of N.J., assignors to Engelhard Minerals & Chemical Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 765,979, Oct. 8, 1968, abandoned. This application Jan. 6, 1971, Ser. No. 104,474
Int. Cl. D21h *1/28*
U.S. Cl. 117—155 UA 3 Claims

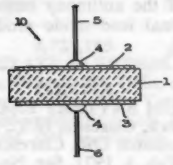
This application is directed to the preparation of receiving sheets for printing with transferable colorless, color-forming dye material in which the sensitive pigment that converts the colorless, color-forming dye to colored form is a hydrated aluminum silicate obtained by the hydrothermal treatment of dehydrated kaolin clay. The application discloses the discovery that a high surface area, partially hydrated metakaolin pigment that is capable of producing an intense nonfading printed image may be obtained by terminating the hydration of the dehydrated clay prior to the time when the resulting hydrated aluminum silicate would possess the maximum surface area that could be obtained by the hydrothermal treatment.

3,723,175

NONLINEAR RESISTORS OF BULK TYPE

Takeshi Masuyama, Takatsuki-shi, Michio Matsuoka, Hirakata-shi, and Tsuyoshi Nishi, Osaka-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Original application Sept. 27, 1968, Ser. No. 763,285, now Patent No. 3,663,458. Divided and this application June 11, 1970, Ser. No. 57,875
Int. Cl. B44d *1/02;* C23c *3/00, 3/04*
U.S. Cl. 117—201 6 Claims



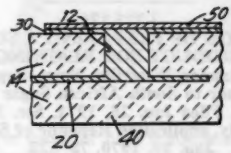
Improved nonlinear resistors of high *n*-value, wherein the nonlinearity is due to the bulk thereof and comprising a sintered body of zinc oxide with 0.1 to 1.0 mole percent bismuth oxide on a sintered body of zinc oxide at a temperature of 600° C. to 1200° C. for a time sufficient to diffuse bismuth ions into the bulk of the sintered body and heating the coated body.

3,723,176

ALUMINA PALLADIUM COMPOSITE

Paul R. Theobald, Chattanooga, and Joseph T. Bailey, Hixson, Tenn., assignors to American Lava Corporation, Chattanooga, Tenn.

Continuation-in-part of applications Ser. No. 831,911, June 10, 1969, now abandoned, and Ser. No. 834,803, June 19, 1969, now Patent No. 3,627,547. This application Feb. 18, 1971, Ser. No. 116,604
Int. Cl. B44d *1/18;* C04b *33/26*
U.S. Cl. 117—212 5 Claims



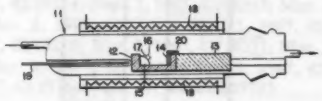
Intermediate alumina substrates containing buried palladium conductor patterns and adapted for thick or thin film hybrid integrated circuits are provided which can be fired in air i.e., under normal oxidizing conditions, and yet in which the ceramic of the substrate matures without adversely affecting buried palladium circuits.

3,723,177

METHOD OF PRODUCING A GROUP III-V SEMICONDUCTOR COMPOUND

Masaharu Toyama, Kashiwa, and Tetuo Sekiwa, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Mar. 17, 1970, Ser. No. 20,215
Claims priority, application Japan, Mar. 18, 1969, 44/20,108
Int. Cl. B44d *1/18*
U.S. Cl. 117—217 2 Claims



A compound semiconductor epitaxially grown on a transparent and insulating substrate of an aluminium oxide, the compound being formed of elements of Groups III and V of the periodic table. The Group III–V compound semiconductor is produced by epitaxially growing a single crystal of a Group III–V compound from a gallium solution incorporating aluminum, which serves to better the wetting of the substrate.

3,723,178

PROCESS FOR PRODUCING CONTACT METAL LAYERS CONSISTING OF CHROMIUM OR MOLYBDENUM ON SEMICONDUCTOR COMPONENTS

Heinrich Sohlbarand, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed March 11, 1971, Ser. No. 123,174
Claims priority, application Germany, March 13, 1970, P 20 12 031.4
Int. Cl. H01l *1/14*
U.S. Cl. 117—227 9 Claims

The invention relates to a method of producing contact metal layers consisting of chromium or molybdenum on

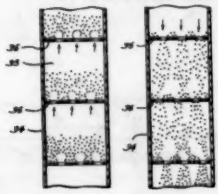
semiconductor components. A varnish solution containing the metal compound is applied to the surface of the substrate wafer and converted into the pure metal layer through ther-

molysis of the varnish containing the metal compound. The invention is particularly well suited for the production of chromium or molybdenum layers on semiconductor crystal surfaces.

3,723,179
METHOD OF PREPARING A SUGAR PRODUCT FOR REFINING
John Briar Alexander, Westville, Natal, Republic of South Africa, assignor to South African Sugar Association
No Drawing. Filed Jan. 28, 1971, Ser. No. 110,594
Claims priority, application Republic of South Africa, Jan. 29, 1970, 70/628
Int. Cl. C13f *3/00*
U.S. Cl. 127—63 **7 Claims**

Raw sugar having a polarization of above 99° is coated with an invert syrup, preferably high-test molasses, to produce a raw sugar for refining not for consumption, having a polarization between 97° and 99°. The product contains more crystallizable sucrose than the usual raw sugars having a polarization between 97° and 99°.

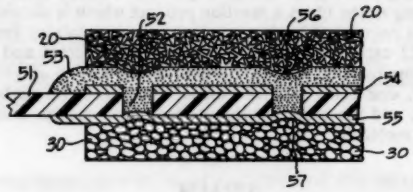
3,723,180
CONTACT PROCESS AND APPARATUS
Hart Brown, 5300 Brownway Road, Houston, Tex.
Division of Ser. No. 701,906, Jan. 31, 1968, Pat. No. 3,549,526. This application Sept. 1, 1970, Ser. No. 68,657
Int. Cl. B01j *1/00, 9/20;* **C22b** *3/00*
U.S. Cl. 134—25 **16 Claims**



A method and apparatus for providing intimate countercurrent contact between a fluid and solid particles in which the fluid is directed through a plurality of trays in one direction to fluidize the solid particles and intermittently the flow is reversed to transport the solid particles through passages in the trays to the next subsequent stage. The apparatus includes a plurality of vertically stacked substantially imperforate trays and tubular members defining passages through the trays and extending substantially above and below the trays.

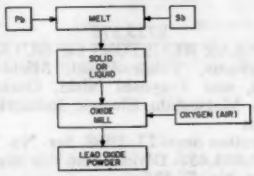
3,723,181
DUPLEX ELECTRODE CONSTRUCTION USING CONTINUOUS ELECTRICALLY NONCONDUCTIVE CARRIER STRIP
Daniel C. Oakley, Madison, Wis., assignor to ESB Incorporated
Filed Dec. 21, 1970, Ser. No. 100,269
Int. Cl. H01m *13/00, 35/32*
U.S. Cl. 136—10 **9 Claims**

Duplex electrodes are constructed by placing intermittent deposits of positive and negative electrodes on opposite sides of a continuous, electrically nonconductive carrier strip. Electrically conductive material on both sides of and extending through holes in the nonconductive strip is used to conduct current between the positive and negative electrodes. The duplex electrodes are assembled into multicell batteries, preferably while the du-



plex electrodes are structually connected by the continuous carrier strip; the carrier strip is then subsequently cut between duplex electrodes to obtain structurally unconnected batteries. Alternatively, the carrier strip may be cut between duplex electrodes before those electrodes are assembled into multicell batteries.

3,723,182
LEAD ACID STORAGE BATTERY WHEREIN A POSITIVE PLATE COMPRISES ANTIMONY DISPERSED THROUGHOUT THE ACTIVE MATERIAL
C. Joseph Venuto, Philadelphia, Pa., assignor to ESB Incorporated
Filed Oct. 27, 1971, Ser. No. 192,947
Int. Cl. H01m *39/00*
U.S. Cl. 136—26 **7 Claims**

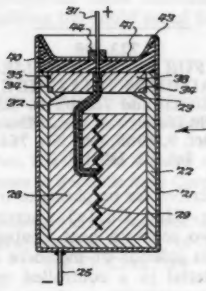


A storage battery positive electrode is disclosed having a grid structure without antimony and a paste containing a small controlled quantity of antimony therein. Methods of preparation of the antimony containing oxide by the use of conventional lead oxide producing equipment is also described.

3,723,183
LITHIUM BATTERY ENCLOSURE
Wilson Greatbatch, Clarence, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.
Filed Feb. 4, 1971, Ser. No. 112,621
Int. Cl. H01m *1/02*
U.S. Cl. 136—83 R **10 Claims**

A lithium-iodine battery comprising an anode of lithium metal completely enclosing a cathode of iodide material in which cathode there is positioned a current collecting element at or near the center thereof. The anode enclosure is completed by a substantially planar member

of lithium metal precision fitted into the open end of the hollow member and bonded thereto. The anode enclosure,

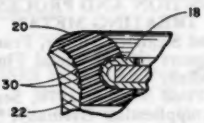


in turn, is located within a moisture-proof, sealing housing.

3,723,184
COMPRESSION CELL CLOSURE

Robert E. Stark and Douglas W. Walker, Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Dec. 11, 1970, Ser. No. 97,209
Int. Cl. H01m *1/02*
U.S. Cl. 136—133 **6 Claims**



A battery cell closure is described comprising: (1) a cell container having alternate upstanding projections and depressions along the inner sidewall of its mouth portion, (2) a top closure for the cell container, and (3) a compressible insulating and sealing annular polymeric ring engaging and interposed between the top closure and cell container. The seal is effected by radially compressing the mouth of the cell container inwardly toward its longitudinal axis. The annular ring is made to flow into the depressions of the container inner sidewall and form the seal.

3,723,185
SOLID STATE ELECTROLYTE

Geoffrey W. Mellors, Strongsville, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

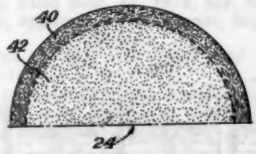
No Drawing. Original application Feb. 4, 1970, Ser. No. 8,709. Divided and this application Nov. 19, 1970, Ser. No. 91,216
Int. Cl. H01m *11/00*
U.S. Cl. 136—153 **3 Claims**

Novel compounds which are solid ionic conductors at room temperature are disclosed. These compounds conform to the general formula AgI—MCN—AgCN or modifications thereof wherein M is potassium, rubidium, cesium or mixtures thereof.

3,723,186
ELECTROLYTE SEAL MEANS

Alina Z. Borucka, Livingston, N.J., Leonard G. Marianowski, South Holland, Ill., and Bernard S. Baker, Brookfield Center, Conn., assignors to Institute of Gas Technology

Continuation-in-part of application Ser. No. 795,641, Jan. 31, 1969. This application Nov. 5, 1971, Ser. No. 196,168
Int. Cl. H01m *27/02, 43/06*
U.S. Cl. 136—153 **15 Claims**

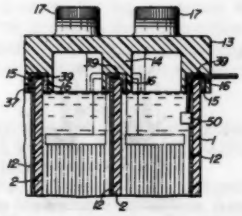


An electrolyte mass for high temperature electrochemical cells particularly for use in multiple cell batteries wherein the mass includes an integral seal. The electrolyte mass is the molten carbonate electrolyte type and is supported by an inert matrix or filler material. The improvement comprises a substantially rigid and substantially inert load supporting outer electrolyte periphery which is capable of withstanding the compressive forces necessary to hold each of the electrolyte masses in place in a multiple cell battery; the central portion of the electrolyte mass is integrally formed interior of the rigid outer periphery and is the electrochemically active portion of the cell.

3,723,187
STORAGE BATTERY WITH HEATER

Tadao Toydoka, 16-6, Oshimacho-1-chome; Takeo Nishida, c/o Shizuhoso of 72, Nishi-5-chome, Honancho, both of Toyonaka, and Hiroshi Ichihara, 1758, Kamelno, Fujisawa, all of Japan

Division of Ser. No. 708,676, Feb. 27, 1968, Pat. No. 3,623,916. This application Jan. 8, 1971, Ser. No. 105,004
Claims priority, application Japan, Mar. 2, 1967, 42/18199; Mar. 2, 1967, 42/18214; Mar. 2, 1967, 42/18215; Mar. 2, 1967, 42/18216; Mar. 2, 1967, 42/18217; Mar. 2, 1967, 42/18218; Mar. 2, 1967, 42/18220; Mar. 2, 1967, 42/18221; Mar. 2, 1967, 42/18222; Mar. 2, 1967, 42/18223; Mar. 8, 1967, 42/20258; Mar. 27, 1967, 42/19752; Mar. 27, 1967, 42/19753
Int. Cl. H01m *45/02*
U.S. Cl. 136—161 **5 Claims**



A storage battery comprising electrode plate groups including anode plates and cathode plates, a battery casing for accommodating said electrode plate groups and electrolyte, a closure covering said battery casing, and face heaters so treated as to be of electrolyte-resistance and provided in said battery casing, wherein said electrolyte is effectively heated to prevent the electromotive force from being decreased due to a

decrease in temperature of said electrolyte, thereby producing a constant electromotive force.

3,723,188

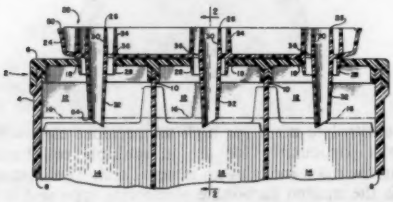
FILLING AND VENTING DEVICE FOR A STORAGE BATTERY

Roy Erving Hennen, Mequon, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Continuation of abandoned application Ser. No. 886,460, Dec. 19, 1969. This application Nov. 8, 1971, Ser. No. 196,835

Int. Cl. H01m *7/00*

U.S. Cl. 136—162 **5 Claims**



A device for filling and venting each cell of a storage battery comprising a reservoir base forming a reservoir for water on the battery, a standpipe for each cell of the battery, an opening in the bottom of the base operatively associated with each standpipe for introducing the water into the cell, and closure means for sealing the top of the cell to the bottom of the base and for directing water from the opening into the cell. Each standpipe extends vertically through the reservoir into a cell to a level substantially equal to the desired operating level of liquid electrolyte in the battery, whereby water introduced into the reservoir will fill each cell of the battery until the electrolyte level reaches the bottom of the standpipe therein.

3,723,189

THERMOELECTRIC DEVICE

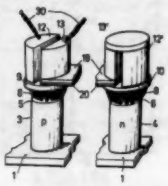
Paul Zahn, Ottobrunn, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Aug. 6, 1969, Ser. No. 849,289

Claims priority, application Germany, Aug. 10, 1968, P 17 64 816.7

Int. Cl. H01v *1/02*

U.S. Cl. 136—205 **6 Claims**



A staged thermoelectric device comprises a plurality of semiconductor segments and thermocouples. The segments are of different materials chosen according to the particular effective temperature ranges — in the following designated as stages — in which they will operate and according to the required electrical polarity. All the segments of one stage are connected thermally in parallel, whereas the stages are interconnected thermally in series. The arrangement is such that the number of segments within the individual stages differs and at least two segments of each stage are connected electrically to form segmented legs of an individual thermocouple, while the remaining segments of each stage are connected electrically in series to form additional thermocouples within the respective stage.

3,723,190

PROCESS FOR PREPARING MERCURY CADMIUM TELLURIDE

Paul W. Kruse, Edina, and Joseph L. Schmit, Hopkins, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1968, Ser. No. 766,235

Int. Cl. H01l *3/20*

U.S. Cl. 148—1.5 **11 Claims**

A process is described for preparing or treating mercury cadmium telluride ($Hg_{1-x}Cd_xTe$) wherein the material is subjected to two separate heat treatment steps. The treatment improves inferior or mediocre infrared radiation detector material in a controlled manner without adversely affecting originally good material thereby increasing process yield and reproducibility.

3,723,191

SOLDERING FLUX COMPOSITION

Julius Goeman Bos, Harm Draaijer, and Jan Duyve, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1971, Ser. No. 122,381

Int. Cl. B23k *35/36*

U.S. Cl. 148—23 **4 Claims**

A solution of sorbitol in a water-alcohol mixture for use in a foam fluxing device. The solution comprises activators. Remainders of the flux may be washed off with water and are not corrosive.

3,723,192

COMPOSITION AND PROCESS FOR TREATING METAL

Han Yong Oei and Siegfried Möller, Frankfurt am Main, Germany, assignors to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Mar. 9, 1970, Ser. No. 18,322

Claims priority, application Germany, Mar. 10, 1969, P 19 11 972.3

Int. Cl. C23f *7/10*

U.S. Cl. 148—6.17 **5 Claims**

A composition and process for the treatment of ferrous metal surfaces utilizing a nitrite accelerated zinc phosphate treating solution, wherein undesired concentrations of ferro-nitroso complexes are prevented by incorporating in the phosphating bath a peroxide containing sulfur oxygen compound. Exemplary of preferred compounds which may be used are $Na_2S_2O_8$ and H_2SO_5.

3,723,193

PROCESS FOR PRODUCING A FINE-GRAINED 316 STAINLESS STEEL TUBING CONTAINING A UNIFORMLY DISTRIBUTED INTRAGRANULAR CARBIDE PHASE

George A. Reimann and William R. Martin, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 27, 1970, Ser. No. 84,283

Int. Cl. C21d *9/08*; C22c *41/02*

U.S. Cl. 148—12.3 **2 Claims**

A fine-grained metal alloy having a second phase randomly-distributed throughout the structure as fine discrete particles is prepared by initially heating the alloy to a sufficiently high temperature to place essentially all of the second phase forming material in the alloy into solution and thereafter subjecting the alloy to repetitive heat treatments, interspersed with cold work, to cause recrys-

tallization and partial precipitation of said second phase material at the lowest temperature commensurate with the degree of cold work.

In one embodiment, austenitic stainless steel Type 316 tubing having a grain size of ASTM–14 (2.4–2.8 microns) and a fine randomly-distributed carbide precipitate (100–1000 angstroms) was prepared. Due to improved metallurgical properties these stainless steels are quite suitable as a cladding for liquid metal fast breeder reactor fuel elements.

3,723,194

METHOD OF PROVIDING SUPERPLASTIC STEEL AND OF PRODUCING ARTICLES BY DEFORMATION THEREOF

Frank A. Hultgren, Burton, and Richard A. Kot, Parma, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 98,674, Dec. 16, 1970, abandoned. This application Feb. 17, 1972, Ser. No. 227,045

Int. Cl. C21d *7/14*

U.S. Cl. 148—12 **18 Claims**

Procedure for converting steel, notably ordinary and alloy grades of low carbon, ferritic character, to a superplastic state, e.g. affording very high ductility, and for deforming such superplastic steel in a desired manner, embraces: rapidly heating a body of steel to a temperature, advantageously in the alpha-plus-gamma phase field, where the steel is then found, over a brief interval, to experience a transitional state of severe microstructural instability and to be characterized by superplasticity; and applying stress to the body in such interval to effect the desired deformation. Enhanced effectiveness of the process can be attained in suitable situations where the steel is extensively cold worked, e.g. by reduction upwards of 70 percent, without annealing, prior to the heating stage, the occurrence or progress of recrystallization at the elevated temperature being then found to coact in the transitional condition of microstructure that affords superplasticity. Large and complex deformations can be achieved by the process, at conveniently high strain rates.

3,723,195

PROCESSES FOR MAKING CUTTING INSTRUMENTS

Francis E. Flaherty, Canton, and Wyman C. Tupper, Marblehead, Mass., assignors to The Gillette Company, Boston, Mass.

No Drawing. Filed Dec. 3, 1969, Ser. No. 882,345

Int. Cl. C21d *7/02*

U.S. Cl. 148—12.4 **19 Claims**

The present application discloses novel processes for producing cutting instruments e.g. razor blades, scalpels, knives, etc. from martensitic (Class I) stainless (i.e. containing at least 10% chromium) and semi-stainless (i.e. containing at least 6% chromium) steels. Generally, the processes comprise heating and quenching such steels under conditions which will provide a retained austenite content of at least 35% and thereafter hardening, the areas of the steel in which the cutting edges are to be formed by cold-working.

3,723,196

AGE-HARDENING IRON-BASE ALLOY WITH IMPROVED TOUGHNESS

William J. Murphy and Gerald J. Spaeder, Monroeville Borough, Pa., assignors to United States Steel Corporation

No Drawing. Filed June 18, 1970, Ser. No. 47,611

Int. Cl. C22c *39/10, 39/50*

U.S. Cl. 148—31 **7 Claims**

A maraging steel alloy having, in the aged condition, a yield strength in the 200,000 to 300,000 p.s.i. range and a superior toughness, exhibiting Charpy V-notch values in excess of 100 ft.-lbs. at 80° F. The alloy essentially contains less than 0.005% each of carbon and sulfur, 15–20% nickel, 5–10% cobalt, 3–8% molybdenum, up to 1.5% titanium, up to 0.5% aluminum, and the balance iron with normal incidental impurities. In another embodiment, toughness can be increased appreciably with an insignificant sacrifice in strength by subsituting tungsten for molybdenum.

3,723,197

METHOD OF MANUFACTURING A BODY HAVING ANISOTROPIC, PERMANENT MAGNETIC PROPERTIES

Kurt Heinz Jurgen Buschow, Frans Frederik Westendorp, and Henricus Petrus Johannes Wijn, all of Emmasingel, Eindhoven, Netherlands

No Drawing. Filed Sept. 11, 1970, Ser. No. 71,376

Claims priority, application Netherlands, Sept. 20, 1969, 6914311

Int. Cl. B22f *1/00;* **H01f** *1/08*

U.S. Cl. 148—103 **4 Claims**

A method of manufacturing sintered M_5R magnet bodies (M=Co, possibly combined with Fe, Ni, Cu, and R=one or more of the rare earths and/or Th). Starting materials are two castings one of the atomic ratio M:R<5 and one of M:R>5. They are pulverized, oriented, compressed and sintered in an atmosphere which is very poor in oxygen and water vapour.

3,723,198

METHOD OF STRAIGHTENING ELONGATE INDUCTIVELY HEATED WORKPIECES

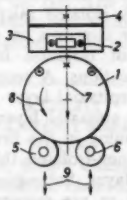
Gerhard Seulen and Friedhelm Reinke, Remscheid, Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Nov. 12, 1970, Ser. No. 88,548

Claims priority, application Germany, Nov. 25, 1969, P 19 58 994.7

Int. Cl. C21d *1/78*

U.S. Cl. 148—131 **10 Claims**



A method and apparatus for inductively heating and straightening an elongate workpiece wherein stop means, such as rollers, are advanced into contact with the heated workpiece not earlier than immediately prior to cessation of inductive heating so that the rotating workpiece is straightened as it cools. In one apparatus the workpiece holding element is pivotable from a position adjacent the inductor to a position adjacent a quenching coil so that the workpiece can be quenched immediately after heating.

3,723,199

OUTDIFFUSION EPITAXIAL SELF-ISOLATION TECHNIQUE FOR MAKING MONOLITHIC SEMICONDUCTOR DEVICES

Madhukar B. Vora, Beacon, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

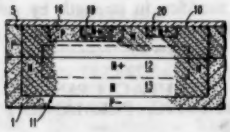
Filed Nov. 10, 1969, Ser. No. 875,012

Int. Cl. H01l *7/00, 7/64, 19/00*

U.S. Cl. 148—175 **9 Claims**

A subcollector window is opened in an oxide covered P^- silicon substrate. Two N dopants of different diffusion rates (arsenic and phosphorous) are diffused through the window into the substrate. The oxide covering is removed and a P^- silicon epitaxial layer is deposited on the substrate and reoxidized. During the reoxidation cycle, the phosphorous and arsenic are out-diffused, the phosphorus reaching the top surface of the epitaxial layer to produce

an N pocket in the P⁻ epitaxial layer and substrate, the pocket having a heavily doped N+ region adjacent the



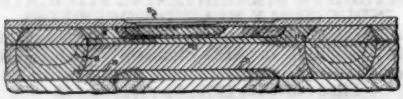
epitaxial layer-substrate interface. Base and emitter diffusions are made within the N pocket to form a transistor.

3,723,200

EPITAXIAL MIDDLE DIFFUSION ISOLATION TECHNIQUE FOR MAXIMIZING MICROCIRCUIT COMPONENT DENSITY

Paul P. Castrucci, Poughkeepsie, Edward G. Grochowski, Wappingers Falls, Martin S. Hess, Poughkeepsie, and Elias B. Zachos, Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,449
Int. Cl. H01l *7/00, 19/00*
U.S. Cl. 148—175 **4 Claims**



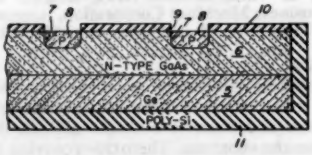
A monolithic microcircuit fabrication method employing an optimized middle isolation technique for producing specific vertical diffusion walls of minimum critical horizontal dimensions is disclosed to facilitate maximum density of electrically isolated microcircuit components. A first epitaxial layer is grown on a semiconductor substrate and regions of isolation impurities are placed therein at desired locations. A second epitaxial layer is grown over the first epitaxial layer (while the impurities out-diffuse into both epitaxial layers) until the non-isolated thickness remaining in the first epitaxial layer becomes equal to the non-isolated thickness remaining in the second epitaxial layer. Subsequent conventional heat treatment steps such as are required for the oxidation and diffusion cycles of typical microcircuit components continue the out-diffusion of the impurity regions so as to form completed vertical isolation walls between said components.

3,723,201

DIFFUSION PROCESS FOR HETEROEPITAXIAL GERMANIUM DEVICE FABRICATION UTILIZING POLYCRYSTALLINE SILICON MASK

John G. Keil, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 1, 1971, Ser. No. 194,467
Int. Cl. H01l *7/44, 7/00*; B01j *17/00*
U.S. Cl. 148—175 **5 Claims**



There is disclosed a method of manufacturing light emitting semiconductor structures of GaAs and $GaAs_xP_{1-x}$ on germanium substrates utilizing a diffusion mask of polycrystalline silicon.

3,723,202

EXPLOSIVE COMPOSITION CONTAINING LITHIUM PERCHLORATE AND A NITRATED AMINE

John Mann Butler, Archie E. Follett, and Robert A. Cass, Dayton, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Dec. 9, 1968, Ser. No. 782,422
Int. Cl. C06b *11/00*
U.S. Cl. 149—19 **7 Claims**

An explosive composition comprising a dispersion of a solid explosive such as RDX or HMX in a substantially homogeneous mixture of a polymerizable acrylate, a plasticizer and lithium perchlorate.

3,723,203

PROPELLANT CHARGE FOR CASELESS AMMUNITION

Alan D. Craig and Carl A. Lukach, Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Sept. 2, 1969, Ser. No. 854,755
Int. Cl. C06b *1/00*
U.S. Cl. 149—19 **13 Claims**

A propellant charge for caseless ammunition is provided. The charge is prepared by compression molding an intimate mixture of propellant granules and 0.1 to 10% by weight of the mixture of a polymeric binder which is certain colloidally dispersible copolymers of ethylene and an α-olefin and/or a non-conjugated hydrocarbon diene, and preferably an ethylene-propylene copolymer or terpolymer.

3,723,204

FLEXIBLE HIGH-VELOCITY EXPLOSIVE

William L. Evans, Blackwood, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Oct. 1, 1969, Ser. No. 862,922
Int. Cl. C06b *3/00, 15/02*; C06c *1/00*
U.S. Cl. 149—19 **8 Claims**

Tough, flexible, high-velocity explosive composition comprising an intimate uniform mixture of a cap-sensitive particulate high explosive, a polyethylacrylate rubber, and optionally a plasticizer.

3,723,205

GAS GENERATING COMPOSITION WITH POLYVINYL CHLORIDE BINDER

Robert S. Scheffee, Lorton, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.

Filed May 7, 1971, Ser. No. 141,311
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 **9 Claims**

An inflation system comprising a gas generator and an inflatable device wherein the gas generator contains a gas-generating composition which produces combustion products free from corrosive, toxic, or inflammable components. The gas-generating composition comprises plasticized polyvinyl chloride fuel binder and a mixture of inorganic oxidizing salt and halogen-free alkali metal salt in a stoichiometry sufficient at the least to transform all carbon, hydrogen, and halogen in the composition to carbon dioxide, water and alkali metal halide.

3,723,206

CASTABLE ILLUMINANT FLARE COMPOSITION

Vern Thomas Dinsdale and Russell Reed, Jr., Brigham City, and Robert E. Meyer, North Ogden, Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Original application Feb. 10, 1969, Ser. No. 797,906, now Patent No. 3,605,624. Divided and this application May 18, 1971, Ser. No. 144,679
Int. Cl. C06d *1/10*
U.S. Cl. 149—19 **4 Claims**

A flare body for a parachute type flare providing superior brilliance and sustained output of illumination even

after 14 days of 24 hour temperature cycling between −65 and 165° F. is obtained by means of a novel, castable illuminant flare composition comprising an uncured, high oxygen content liquid polymeric binder material, particularly a liquid saturated polyester polymer/liquid epoxy resin system, which is loaded into a flare body casing lined on its inner bottom and side surfaces with at least partially cured liner material comprising the binder material and further comprising an anchor sheet material bonded completely on its inner surface to the outer surface of the liner and on its outer surface to the inner casing wall essentially only by a relatively narrow anchor strip of material running from the top to the bottom of the casing. The loaded casing and its contents then are heated to cure the polymeric binder material in the composition, liner and anchor strip.

3,723,207

PROCESS FOR PREPARING STABLE ESSENTIALLY WATER-FREE SLURRIES OF NITROCELLULOSE AND PRODUCTS THEREOF

Albert T. Camp, Indian Head, Md., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,659

Int. Cl. C06b *15/02*

U.S. Cl. 149—92 **8 Claims**

A process for forming essentially water-free stable slurries of plastisol nitrocellulose wherein plastisol grade nitrocellulose and other solids such as cyclotetramethylenetetranitramine, are mixed with an organic liquid diluent capable of forming an azeotrope with water, such as heptane, and a stabilizing amount of metriol trinitrate, and wherein the azeotrope is volatilized from the mixture to form the resultant essentially water-free slurry.

In addition, essentially water-free stable slurries containing plastisol nitrocellulose made by the above process are also provided.

3,723,208

NITROCELLULOSE-NITRIC ESTER EXPLOSIVES COMPOSITION CONTAINING HYDROXYALKYL ETHER OF A POLYSACCHARIDE

Errol Linton Falconer, Mont Saint-Hilaire, Quebec, Canada, assignor to Canadian Industries Limited, Montreal, Quebec, Canada

No Drawing. Filed Feb. 29, 1972, Ser. No. 230,522

Int. Cl. C06b *5/00*

U.S. Cl. 149—94 **2 Claims**

A high explosive composition comprising at least one liquid explosive nitric ester gelatinized by means of nitrocellulose and at least 1% by weight of at least one lower aliphatic glycol selected from the group consisting of ethylene glycol diethylene glycol propylene glycol and dipropylene glycol said glycol having dissolved therein an oxygen-supplying salt and being thickened by a material selected from the hydroxyethyl and hydroxypropyl ethers of polysaccharides and mixtures thereof.

3,723,209

METHOD FOR INCREASING WEAR RESISTANCE OF A RUBBING SURFACE OF ALUMINUM ALLOY ARTICLES

Arinobu Hamada and Yuuji Ohnishi, Kawasaki, and Tunehisa Sekiguchi, Tokyo, Japan, assignors to Showa Denko K.K., Tokyo, Japan

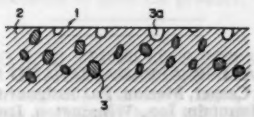
Filed Apr. 13, 1971, Ser. No. 133,562

Claims priority, application Japan, Dec. 25, 1970, 45/117,495

Int. Cl. C23f *1/00*; F02f *7/00*; F16j *11/00*

U.S. Cl. 156—6 **14 Claims**

A method for effectively increasing wear resistance of a rubbing surface of aluminum alloy articles which comprises machining said rubbing surface of a cast aluminum alloy article in which there are dispersed fine particles of magnesium silicide or lead dichloride homogeneously so as to expose some of said particles on the rubbing surfaces, and washing out the exposed silicide or dichloride from the surface layer with an inorganic acid solution



so as to leave fine exposed hollows in the rubbing surface layer as oil pools.

3,723,210

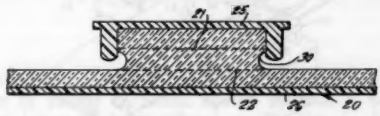
METHOD OF MAKING A SEMICONDUCTOR WAFER HAVING CONCAVE RIM

Niels F. Jacksen, Los Angeles, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Sept. 29, 1970, Ser. No. 76,422

Int. Cl. H01l *7/50*

U.S. Cl. 156—11 **4 Claims**



Two junctions of a controlled rectifier terminate on a concave rim of a semiconductor wafer. Both junctions terminate at an angle which spreads out the voltage gradient across the junction at the rim. The contour is formed by etching through the wafer and etching under an etch-resistant coating in a channel which circumscribes a surface area of the wafer.

3,723,211

PREPARATION OF LAYOUT SHEETS FOR PRINTED WIRING

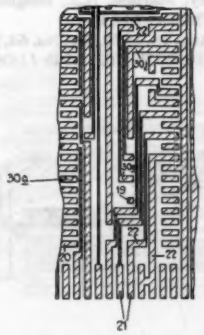
Ivor Howard Etherton, Sutton Coldfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 16, 1971, Ser. No. 115,645

Claims priority, application Great Britain, Feb. 17, 1970, 7,482/70

Int. Cl. B32b *31/00*

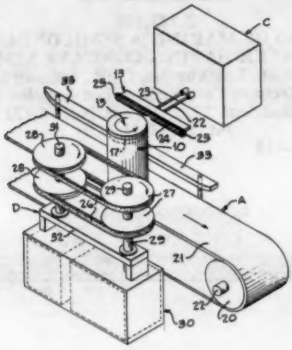
U.S. Cl. 156—63 **18 Claims**



A method of preparing master layout sheets for multilayer printed wiring includes laying transparent sheets over a guide layout marked with a grid and applying opaque material to

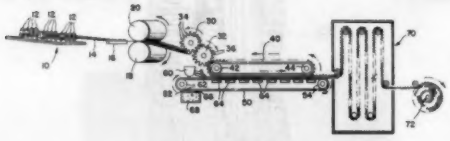
selected areas of the sheets. The grid may include additional lines and areas which correspond to some of the required opaque areas on the sheets. The transparent sheets may be prepared with some of said areas before being laid over the guide layout.

3,723,212
HEAT SEALING APPARATUS AND METHOD
Lee A. Casper, Merion, Pa., assignor to Iron Mountain, Inc., Wilmington, Del.
Filed Apr. 26, 1971, Ser. No. 137,434
Int. Cl. B29c *27/04*
U.S. Cl. 156—69 8 Claims



Radio frequency energy is utilized to adhesively secure a plug closure in an end of a laminated cylindrical container having a metallic foil lamina and an interior coated with a thermoplastic adhesive. The closure is inserted and frictionally retained in an end of the container, following which it is adhesively and permanently secured. This is done by conveying it through a heat sealing station wherein it is rotated and subjected to moving tangential contact with a beam of radio frequency energy. The metallic foil lamina, acting as an inductive susceptor, causes selective and sequential sealing of closure and container, as the container is rotated.

3,723,213
METHOD OF MAKING NON-WOVEN PILE FABRIC
Charles Edwin Hoey, Marlton, N.J., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Aug. 18, 1970, Ser. No. 64,722
Int. Cl. B32b *5/02*; D04h *11/00*
U.S. Cl. 156—72 5 Claims

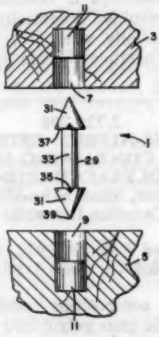


Continuous strands of yarn are formed into loops defining upper and lower bight portions. A body of liquid resinous backing material is formed, and the lower bight portions of the loops of yarn are moved into the liquid backing material so that these lower bight portions are substantially embedded within and penetrated by the backing material. The backing material is then solidified.

3,723,214
METHOD OF MAKING A STEEL, GRAPHITE, PHENOLIC ASBESTOS LAMINATE
Daniel Meraz, Jr., China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Mar. 1, 1971, Ser. No. 119,949
Int. Cl. B32b *31/00*
U.S. Cl. 156—87 3 Claims

A high temperature laminate and method of fabrication consisting essentially of consecutive layers of steel, graphite and phenolic asbestos held together by a self-supporting adhesive film. This laminate is useful in the manufacture of rocket nozzles which withstand temperatures of 6,000° F. and above.

3,723,215
METHOD FOR FIXING A FASTENER IN TWO PIECES OF WOOD
John W. Kessler, 1172 Glenwood Blvd., Schenectady, N.Y. 12308
Filed Mar. 18, 1970, Ser. No. 20,591
Int. Cl. B32b *31/04*
U.S. Cl. 156—92 2 Claims

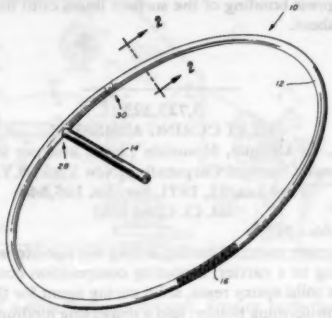


Discloses a fastener and method of fixing same together with two pieces of wood. Cartridges containing thermosetting material, comprising resin and hardener, are disposed in aligned holes drilled in the two pieces of wood. A dowel-like fastener having piercing points is disposed such that one piercing point punctures the cartridge, disposed in the hole of the one piece of wood, to effect bonding of the fastener with such other piece of wood, and thereby fastening together the two pieces of wood.

3,723,216
METHOD OF MAKING EXPANSIBLE SEAL FOR VALVES
Creal E. Kirkwood, 3237 North Lewis, Tulsa, Okla.
Filed Aug. 25, 1971, Ser. No. 174,717
Int. Cl. B29c *27/00*; B29h *7/04*
U.S. Cl. 156—110 4 Claims

An expandable seal for valves, the seal having a closed resilient tubular loop of expandable material, the loop having an opening therein, and a resilient tubular leader integrally formed with the loop communicating with the opening. The invention also includes the method of manufacturing an ex-

pandable seal by means of a sequency of steps utilizing mandrels and a heated platten for forming a length of expandable



tubing into a closed loop having an integral leader extending therefrom.

3,723,217

METHOD OF PRODUCING BONDED TEXTILE FABRICS WITH IMPROVED DIMENSIONAL STABILITY

Jackson Bauer, Croydon, Pa., assignor to Collins and Aikman Corporation, New York, N.Y.

Filed July 11, 1969, Ser. No. 841,042
Int. Cl. B32b *31/08*
U.S. Cl. 156—164 **6 Claims**

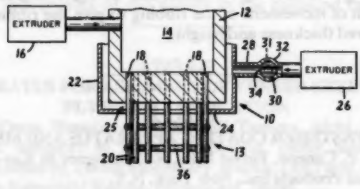
A method is provided for producing a bonded textile fabric with improved laundering and dry cleaning dimensional stability in which a composite comprised of at least two plies of the same or different textile fabrics with the plies bonded together by an uncured to partially cured adhesive being compacted and then completely cured. The bonded textile fabrics of this invention are especially useful in the manufacture of wearing apparel, but also find uses in home furnishings and industrial fabrics.

3,723,218

METHOD FOR THE MANUFACTURE OF NET AND NETLIKE PRODUCTS

Bernard J. Gaffney, Stillwater, Minn., assignor to Conwed Corporation

Filed Oct. 5, 1970, Ser. No. 78,080
Int. Cl. D01d *5/00*; D04h *3/16*
U.S. Cl. 156—167 **7 Claims**



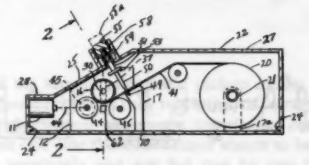
A method and apparatus for the manufacture of net and netlike products from molten polymer is provided. The apparatus is comprised of at least two die members, one of which has one or more orifices therein for the extrusion of one or more strands or a sheet of polymer. The other die member has a single continuous orifice therein to which molten polymer is fed and from which the molten polymer is forcefully ejected at predetermined intervals to contact the extruding strands or sheet to cause bonding therebetween to form the product.

3,723,219

METHOD AND APPARATUS FOR MAKING HAIR CURLERS

Zodell W. Prince, 601 Mulberry Lane, Bellaire, Tex. 77401; Dallas D. Weatherholt, 13207 Buxley 77045; and Adelene L. Trombatore, 9725 Mariposa 77025, both of Houston, Tex.

Filed Nov. 18, 1970, Ser. No. 90,694
Int. Cl. B29d *23/10*
U.S. Cl. 156—218 **5 Claims**



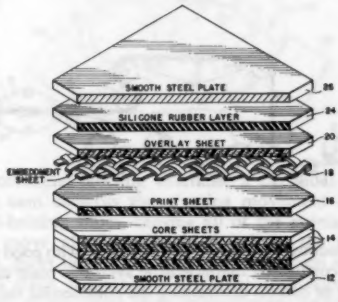
Method and apparatus for making hair curlers wherein a strip of plastic or plastic coated material is bent by passing between three rollers, or the like, to form a circular hair curler shape. The diameter of the hair curlers or hair rollers is adjustable by adjustments of the spacings of the rollers. The strip passes between two rollers at one side and a third roller disposed linearly between the first two rollers at the other side of the strip. The strip is cut by a knife means or by a hot wire means. Only one or more of the rollers may be position-adjustable. The strip ends are joined by heat-bonding, and may be joined at lapped or butt joints. The strip is carried as a roll, like a roll of adding machine tape.

3,723,220

HIGH-PRESSURE LAMINATES WITH DEEPLY EMBOSSED SURFACE

Herbert I. Scher and Israel S. Ungar, Randallstown, Md., assignors to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 94,096, Dec. 1, 1970, now Patent No. 3,700,537. This application Aug. 9, 1971, Ser. No. 170,117
Int. Cl. B32b *3/30*
U.S. Cl. 156—219 **7 Claims**



A high-pressure laminate with deeply embossed surface is produced using as a decorative sheet beneath the overlay, a relatively thick element of varying cross section,

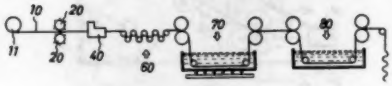
such as woven cane. During laminating, a silicone rubber layer is included between the overlay sheet and the upper caul plate. The resultant laminate is found to be debossed to a depth that is substantially equal to the thickness variation in the ply of varying cross sections, and may even be undercut. In addition, the depressed portions of the laminate surface are fully consolidated. The silicone rubber may be reused.

3,723,221

PROCESS FOR MANUFACTURING WEIGHTED CORD AND THE SAME

Yukio Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kaikosha, Tokyo, Japan

Filed Nov. 2, 1971, Ser. No. 194,861
Int. Cl. B29c *17/04*
U.S. Cl. 156—229 **3 Claims**



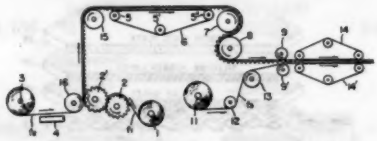
A weighted cord or strip for curtain use, manufactured by the steps of coating a notched core member with a foamed thermoplastic synthetic resin, subjecting the sheathed core member to an external force to thereby cut or divide the core member into core pieces at the notched locations, applying a tensile force under heating condition to the sheath which is thus elongated along the longitudinal direction whereby the cut core pieces are moved away from each other to provide a fixed space between any two adjacent core pieces, and finally cooling the sheath to be cured at its elongated condition so that the core pieces are maintained in the spaced relation from each other within the sheath.

3,723,222

PROCESS FOR MANUFACTURING CORRUGATED THERMOPLASTIC SYNTHETIC RESIN CARDBOARD SHEET

Kiyoshi Kurita, Tokyo; Hiroshi Shigematsu, Ichihara; Tomoyuki Koyama, Yokohama; Souichiro Endo, Tokyo, and Kensaku Yamawaki, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 1, 1970, Ser. No. 33,563
Int. Cl. C09j *7/04*
U.S. Cl. 156—309 **6 Claims**



A continuous process for manufacturing with good reproducibility a corrugated thermoplastic synthetic resin cardboard sheet free of defects diminishing the commercial value of the produce such as "warp" and "crookedness". This process is characterized in that thin layers of a thermoplastic synthetic resin having a melting point at least 10°C. lower than that of any of thermoplastic synthetic resins constituting the core sheet and surface liner sheets are formed on faces selected from the group consisting of (i) front and back faces of the continuous thermoplastic synthetic resin sheet to be shaped into a core sheet, (ii) faces to be bonded to the core sheet, of each of said surface liners, and (iii) all the faces mentioned in (i) and (ii), before the shaping of the core sheet and before the melt-press bonding of the surface liners onto the continuous core sheet.

3,723,223

HEAT CURING ADHESIVE

Robert A. Le Compte, Mountain Lakes, assignor to National Starch and Chemical Corporation, New York, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,644
Int. Cl. C08d *9/10*
U.S. Cl. 156—313 **19 Claims**

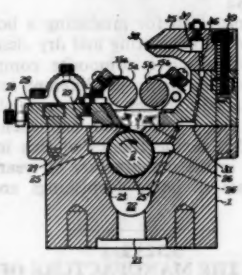
An adhesive material having a long storage life is prepared by applying to a carrier, a coating composition comprising a blend of a solid epoxy resin, solid curing agent for the expoxy resin, a film-forming binder, and a dispersing medium and drying the coating to a tack-free film. The adhesive-coated carrier or the film without the carrier may be used to bond substrates by pressing the substrates together with the adhesive film between them at elevated temperatures.

3,723,224

APPARATUS FOR MAKING RIBBED SYNTHETIC RESIN BOARDS

Ryuji Noguchi, Hamamatsu, Japan, assignor to Kabushiki Kaisha Seisan Nipponsha, Tokyo, Japan

Filed Oct. 14, 1970, Ser. No. 80,617
Int. Cl. B29f *3/012*
U.S. Cl. 156—500 **4 Claims**



A method and apparatus for producing synthetic resin boards having a pair of parallel synthetic resin film layers connected, but spaced apart by ribbing providing hollow spaces between said film layers and which boards are formed by extruding synthetic resin pass a fluted rotating roll and from there pass two opposing nozzles which apply the film layers to the ribbing from said fluted roll and including means for stretching the ribbing in directions at right angles to the direction of movement of the ribbing to give the ribbing walls the desired thickness and height.

3,723,225

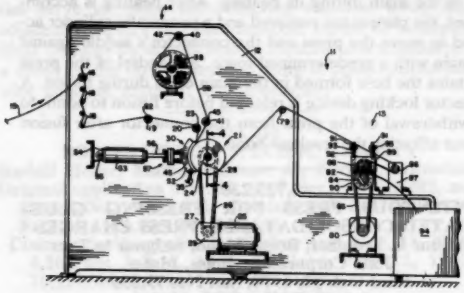
SLIDE FASTENER COATING APPARATUS AND METHOD

William P. Canepa, Forest Hills, N.Y., assignor to Kay-Cee Industrial Products Inc., New York, N.Y.

Filed March 30, 1971, Ser. No. 129,449
Int. Cl. B30b *15/34*
U.S. Cl. 156—554 **7 Claims**

An apparatus and method are disclosed for continuously fusing a thermoplastic material to a slide fastener stringer to enable installation of the slide fastener in a garment or other article by a heat sealing process. The apparatus includes a

heated pressure plate in association with a heated padded roller to fuse a strip of thermoplastic material to a fabric tape



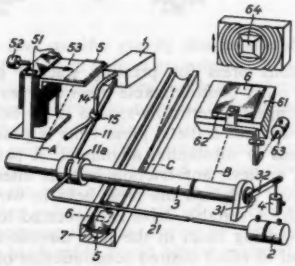
portion of a slide fastener stringer. One or both the pressure plate and the heated roller have non-stick or release-coated working surfaces.

3,723,226

DEVICE FOR PICKING UP SECTIONS FROM A MICROTOME

Wolfgang Pfohler, Lauda, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany

Filed June 4, 1971, Ser. No. 149,917
Claims priority, application Germany, June 12, 1970, P 20 28 898.6
Int. Cl. B26d *4/46*; B65f *35/18*
U.S. Cl. 156—556 **9 Claims**



A device for picking up sections from the blade of a microtome, in particular frozen sections, comprises gripper means for automatically lifting slides from a slide depot, for moving the slides to the blade, bringing the slide into contact with the section, and transporting slide and section to a guide rail where the slide is released. The gripper means is pivotable about a shaft and laterally displaceable thereon. Mechanical elements are provided for controlling the movements of the means in the required order.

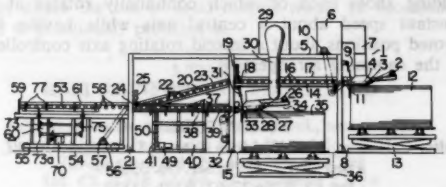
3,723,227

APPARATUS FOR ASSEMBLY OF VENEER SHEETS IN PLYWOOD FABRICATION

Hiroshi Oono, Nagoya, and Masanori Tamura, Aichi, both of Japan, assignors to Kabushiki Kaisha Taihei Seisakusho (also known as Taihei Machinery Works, Ltd.) and Mizuho Gohan Kabushiki Kaisha, Nagoya-shi, Japan

Filed Feb. 23, 1971, Ser. No. 117,977
Claims priority, application Japan, Feb. 25, 1970, 45/18504
Int. Cl. B32b *31/12*; B65g *29/00*
U.S. Cl. 156—557 **9 Claims**

First and second pneumatic pickup means include a first and a second suction duct, respectively, thereby successively to pick up veneer sheets stacked up separately on first and second lifter means. First and second conveyor means extend in succession from the first pneumatic pickup means, whereas third conveyor means extend underneath the downwardly inclined second conveyor means from the second pneumatic pickup means to a point of termination of the second conveyor means, so that the veneer sheets picked up separately by



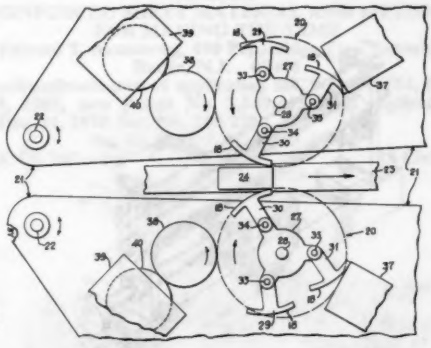
the first and the second pneumatic pickup means are superposed one upon another as they reach fourth conveyor means, from which the veneer sheets are transferred onto a stand positioned on one side thereof. Veneer sheets to be glued are stacked up separately and are fed one by one into gluing means positioned on the other side of the fourth conveyor means and thence are carried over to the aforesaid stand by fifth conveyor means.

3,723,228

APPARATUS FOR PICKING UP LABELS FROM A SUPPLY STACK AND DIRECTLY APPLYING THE LABELS TO CONTAINERS

Herbert Schaltegger, P.O. Box 293, New Milford, Conn. 06776

Filed Feb. 8, 1971, Ser. No. 113,174
Int. Cl. B65c *9/12*
U.S. Cl. 156—568 **16 Claims**



In a container-labeling machine, a cycloidal motion-inducing cam controls the pivoting movement of rotating label-holding shoes, causing all of the points of each shoe to move along a cycloidal path as the shoe approaches, picks up a label and withdraws from a stationary label stack holder. The cycloidal cusp approach-retreat path of the label shoe approximates uniform rolling contact of each shoe with a fresh label, assuring the application of smooth, untorn, unwrinkled labels to each new container. The camming arrangement is further adapted to maintain the arcuate-shaped, peripheral surface of each label shoe coincident with a circle

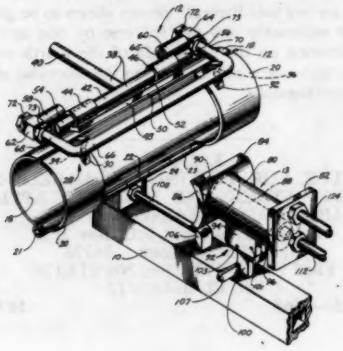
having its center point on the central axis of rotation as the label-holding shoe passes into contact with an adhesion-inducing apparatus and then applies the label to the container. The label is held in intimate contact with the shoe by vacuum, and the label is applied to the container by disconnecting the vacuum or by supplying a pressure to the shoe's holding surface which is greater than atmospheric pressure. In the preferred embodiment, the labeling machine comprises three label-holding shoes each of which continually rotates at a constant speed about a central axis while having its pivoted positions about a second rotating axis controlled by the camming arrangement.

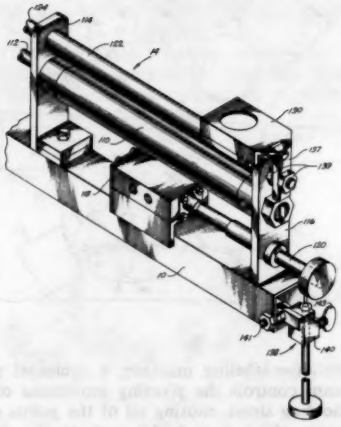
3,723,229

FUSION TOOL

Walter C. Hutton, 1567 Waldran Avenue, Los Angeles, Calif.

Filed May 1, 1970, Ser. No. 33,549
Int. Cl. B29c *27/02*; B32b *31/20*
U.S. Cl. 156—580 **17 Claims**





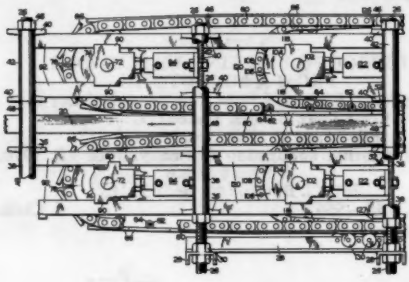
The fusing of a service connector to a main is effected by holding the main firmly in place with a clamp while the service connector is pressed against it with a press, the areas of each being fused, having previously been heated to fusion temperature. The press receives the service connector and holds it firmly while the connector's saddle and the main are brought into fusion temperature by a pair of heating platens. The heating platen for the main has a hole forming die which effects a hole in the main during its heating. After heating is accomplished, the platens are removed and a pneumatic cylinder actuated to move the press and the connector's saddle against the main with a predetermined force. A mandrel of the press maintains the hole formed in the main open during fusion. A connector locking device is released before fusion to admit to the withdrawal of the press from the connector after fusion without affecting the resultant bond.

3,723,230

CONTINUOUS PRESS FOR PRESSING GLUE-COATED CONSOLIDATABLE, PRESS CHARGES

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Filed Oct. 12, 1970, Ser. No. 79,839
Int. Cl. B30b *13/00, 3/00*
U.S. Cl. 156—580 **17 Claims**



A continuous press for pressing stacked glue-coated laminae and other consolidatable press charges comprises a pair of elongated, vertically-spaced press beds. A pair of vertically-spaced, endless, press belts is positioned between the beds in substantial alignment. A pair of vertically-spaced, endless, anti-friction belts is interposed between the press beds and the press belts in working contact therewith. A suitable drive is connected to the press belts for advancing them in the feed direction at a rate predetermined to effect desired consolidation of the press charge during setting. Clamping pressure is applied to the press belts at predetermined intervals along their length to determine the final thickness of the consolidated product.

3,723,231

INSULATION MATERIAL

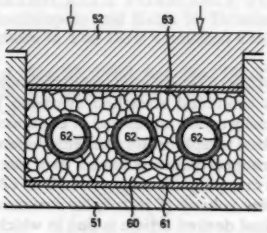
John P. Clay, San Diego, and Vernon L. Lintvedt, La Mesa, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation of abandoned application Ser. No. 670,889, Sept. 27, 1967. This application Oct. 1, 1970, Ser. No. 77,325
Int. Cl. C04b *43/00*
U.S. Cl. 161—53 **2 Claims**

An insulation material comprising a thermal heat reflecting material such as aluminized polyester film, viz,

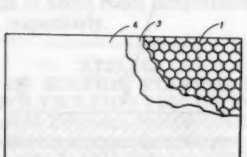
Mylar, provided with a multiplicity of fiber tufts of flocking material spaced apart and bonded to the Mylar in a substantially polka-dot pattern. The upstanding fiber bristles serve to space the reflecting material away from adjacent structure or other adjacent layers of insulation. Heat transfer by conduction is reduced to a minimum as a result of the tufts of bristles being in point contact only with adjacent material and structure.

3,723,232
BODIES OF LOW SPECIFIC GRAVITY
Rudolf Heller, Mattackerstrasse 43, Zurich, Switzerland
Original application Mar. 17, 1967, Ser. No. 623,882, now Patent No. 3,598,672. Divided and this application Feb. 16, 1971, Ser. No. 115,644
Claims priority, application Switzerland, Mar. 23, 1966, 4,201/66; July 5, 1966, 9,763/66; July 12, 1966, 10,117/66; Oct. 20, 1966, 15,226/66
Int. Cl. B32b *3/12, 27/30*
U.S. Cl. 161—68 **4 Claims**



Bodies of low specific gravity are produced by coating a mass of roundish hollow granules, such as expanded or swelled polystyrene granules, with a hardenable liquid binder material, mixing the mass of thus coated granules with a pulverulent solid material so as to adhere particles of the solid material to the coating, and hardening the hardenable binder coating. Shaped cellular structures are formed from the mass of hardenable binder-coated hollow granules having pulverulent material adhering to the coating, by compressing the mass during or prior to the hardening of the hardenable liquid binder material.

3,723,233
MARBLE FACED WALL PANELS AND METHOD OF MAKING SAME
Patrick Terence Bourke, Doon House, Maam, Galway, Ireland
Continuation of abandoned application Ser. No. 706,719, Feb. 19, 1968. This application July 15, 1971, Ser. No. 163,070
Int. Cl. B32b *3/12*
U.S. Cl. 161—68 **2 Claims**

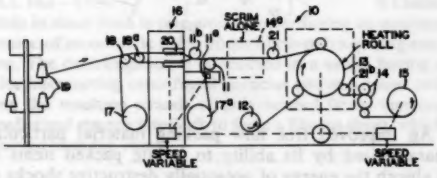


The invention provides surface elements such as tiles or panels consisting of a thin lamina of marble bonded to a backing consisting of a metal sheet of honeycomb or cellular structure of substantially greater thickness than said lamina which at least on the side remote from the marble lamina has a skin of tenacious sheet material bonded thereto. The resultant composite element is extremely rigid, light and cheap to produce in comparison with solid marble and may be cut into any desired shape and used as a substitute for solid marble, but with the advantages of lightness, strength and low cost thus enabling such surface elements to be used for many purposes where the use of solid marble would be economically or practicably prohibitive.

3,723,234
KNIT REINFORCING FABRIC AND RESIN LAMINATE
John A. MacDonald, Hockessin, Del., assignor to Chapman Industries Inc., Avondale, Pa.
Filed Apr. 27, 1971, Ser. No. 137,791
Int. Cl. B32b *27/04, 27/06;* **B65d** *25/14*
U.S. Cl. 161—89 **5 Claims**

A reinforced fabric and resin laminate wherein the interlaced fabric imparts dimensional stability and strength to the resin component, while the knit character thereof permits shaping the fabric or the composite laminate over irregular or curved surfaces as well as permitting extension of the embedded fabric with elongation of the resin, in addition to enhancing the mechanical bond to the resin.

3,723,235
REINFORCED SHEET MATERIAL AND METHOD FOR MAKING THE SAME
Edward T. Armstrong, 490 Pepperidge Tree Terrace, Butler, N.J. 07405
Continuation-in-part of application Ser. No. 673,164, Oct. 5, 1967, now Patent No. 3,549,455. This application Dec. 21, 1970, Ser. No. 100,238
Int. Cl. B32b *3/02;* **D04h** *3/12*
U.S. Cl. 161—140 **13 Claims**



Disclosed is a reinforced sheet material or scrim which consists of filaments extending in wave forms along the material. The filaments preferably extend in overlapping paths along certain portions of the material and along paths of progressively decreasing amplitude on either side of the uniform portion, but with about the same frequency as in the uniform portion, towards the edges of the material, slitting points between adjacent uniform portions,

or lap reinforcements. The scrim material may be self-reinforced and may also include linear extending filaments and/or laminated substrates.

3,723,236

NONWOVEN FABRICS AND PROCESS THEREFOR

Nicholas S. Newman, West Newton, Mass., assignor to The Kendall Company, Walpole, Mass.

Division of Ser. No. 863,273, Oct. 2, 1969, Pat. No. 3,622,422, Continuation-in-part of Ser. No. 563,238, July 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 530,734, Feb. 28, 1966, abandoned, which is a continuation-in-part of Ser. No. 514,079, Dec. 15, 1965, abandoned. This application Jan. 25, 1971, Ser. No. 109,645

Int. Cl. C09j *5/00, 704*

U.S. Cl. 161—151 6 Claims

A major portion by weight of an unbonded fibrous fleece is combined by heat and pressure with a minor portion of a thermoplastic film to form soft, conformable, air-permeable nonwoven fabrics suitable for use as disposable clothing.

3,723,237

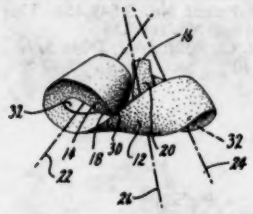
PACKING MATERIAL AND METHOD

Gunter G. Fuss, San Mateo, Calif., assignor to Free Flow Packaging Corporation, Redwood City, Calif.

Filed Feb. 16, 1971, Ser. No. 115,527

Int. Cl. B65d *85/00;* B29d *27/00*

U.S. Cl. 161—168 10 Claims



An improved free flow packing material particularly characterized by its ability to isolate packed items and to absorb the energy of potentially destructive shocks and impacts, together with a method and means for its manufacture. The individual units of the packing material are structurally in the form of relatively elongate thick continuous strips wherein each strip is formed with a gradually twisting spiral configuration, having curling central and end portions. The individual units are of a size and shape to provide a desired free-flowing characteristic, and are formed of a foamed expanded crushable plastic material which inherently possesses a shock absorbing characteristic.

3,723,238

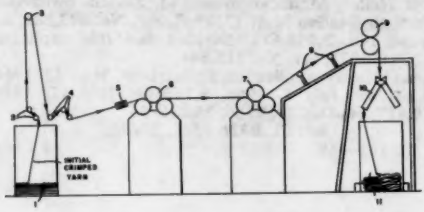
NON-WOVEN FLEECE OF CONTINUOUS FILAMENTS

Helmut Werner, Elsenfeld, and Hans Stapp, Monlingen, both of Germany, assignors to Enka Glanzstoff AG, Wuppertal, Germany

Division of Ser. No. 787,013, Dec. 26, 1968, Pat. No. 3,574,908. This application Sept. 25, 1970, Ser. No. 75,348

Int. Cl. B32b *3/20*

U.S. Cl. 161—169 6 Claims



A non-woven fleece article composed of continuous tubular filaments of a spun and stretched synthetic fiber-forming polymer, especially a yarn composed of continuous hollow tubular polyethylene terephthalate filaments, wherein individual permanently crimped filaments have a yarn size of about 0.5 to 20 denier, a crimping arc number of 50 to 120 arcs per 10 cm. and a hollow volume of its tubular structure of 10 to 30 percent. The final desired article is one in which a fleece has been formed by coiling or layering a yarn consisting essentially of these filaments after the yarn has been subjected to a temporary elongation within the range or region of the stress-strain curve which produces an elastic strain but under a load of at least 0.1 grams/denier, the permanent extension or set of the filaments being less than 4 percent, and then releasing the tension on the yarn whereby the crimped structure of the filaments is reformed and the yarn spreads out laterally. The resulting coiled or layered yarn product is useful as a fleece-like filler material in pillows, quilts, jackets and the like.

3,723,239

RUBBER LAMINATES AND A PROCESS FOR PRODUCING THE SAME

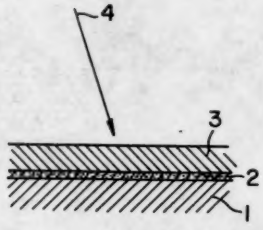
Satoshi Takemura; Elichi Yoshino; Toshio Honda; Elshi Kubota, and Yukio Fukuura, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 19, 1971, Ser. No. 117,020

Claims priority, application Japan, Feb. 23, 1970, 45/14762

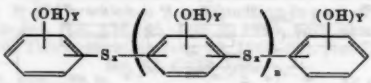
Int. Cl. B32b *5/10;* D04h *3/12*

U.S. Cl. 161—170 2 Claims



A laminate of rubber with a polymeric mono-filament having a large curvature radius of the cross-section or a cord formed by twisting said mono-filaments or the organic

polymeric film is prepared by using an aqueous adhesive consisting of a mixture of a liquid adhesive base consisting mainly of a solution of a polyhydric phenol polysulfide having the general formula



wherein x represents an integer of 2 to 8 and x in each S_x is not always the same integer, Y represents an integer of 2 to 3 and n represents 0 or an integer of 1 to 15, dissolved in a resorcin excess resorcin-formaldehyde condensate and RFL solution consisting of a resorcin-formaldehyde resin obtained by reacting resorcin and formaldehyde and a rubber latex.

3,723,240

ASYMMETRICALLY FOAMABLE STRAND

Richard E. Skochdopole and Keith R. Denslow, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 27, 1968, Ser. No. 732,270
Int. Cl. B65d *85/30*; D02g *3/02*
U.S. Cl. 161—173 **3 Claims**

Generally linear foamable strandular particles which are asymmetrical about a plane generally containing the longitudinal axis provide a desired curled dunnage material when heated to cause foaming. A wide variety of methods may be used to introduce the desired asymmetry.

3,723,241

BONDING OF AROMATIC POLYAMIDE FILM

Julius P. Rakus, Bernards Township, and John A. Penoyer, North Plainfield, N.J., and Michael J. Kowalski, Yonkers, N.Y., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Filed Sept. 23, 1970, Ser. No. 74,891
Int. Cl. B32b *27/06, 27/34*
U.S. Cl. 161—227 **8 Claims**

Two or more structures of wholly aromatic polyamides, either the same or different, are adhered or bonded together as by welding, by inserting between them a film prepared by the reaction of a 70:30 mixture of meta- and para-phenylene diamine and isophthaloyl chloride, the film containing about 5 to 30 weight percent of polymer solvent, adherence accomplished by applying heat and pressure in the range of about room temperature–600° F. and 15 to 500 p.s.i., respectively.

3,723,242

OXIDATION OF SULFIDE PULPING LIQUOR TO FORM POLYSULFIDE LIQUOR IN SITU

Richard G. Barker, Princeton Junction, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Apr. 1, 1971, Ser. No. 130,320
Int. Cl. D21c *3/02*
U.S. Cl. 162—38 **7 Claims**

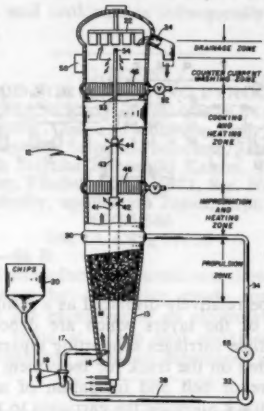
A mixture of black liquor and white liquor is oxidized in the presence of wood to be pulped, so as to form a polysulfide pulping liquor which acts immediately upon the wood. The process allows increased yields of pulp with lower sulfidity levels and, thus, lessened pollution.

3,723,243

CONTINUOUS DIGESTER HAVING SELF-REGULATING WOOD CHIP LEVEL

Karl E. Vogel, Hollis, N.H., assignor to Improved Machinery Inc., Nashua, N.H.

Continuation of application Ser. No. 43,559, June 4, 1970, which is a continuation of application Ser. No. 639,336, May 18, 1967. This application Oct. 18, 1971, Ser. No. 190,245
Int. Cl. D21c *3/00*
U.S. Cl. 162—52 **3 Claims**



A continuous upflow digester of the type wherein liquid is advanced upwardly through a compacted mass of wood chips in a propelling zone to create a force for propelling upwardly the columnar mass of wood chips within the vessel, such vessel having a tapered portion adjacent its lower end, the lower end of the chip mass normally being maintained therewithin in a self-regulating manner while wood chips are accreted thereon at relatively low liquid flow rates by reason of the progressively upwardly decreasing velocity of propelling liquid created within said tapered vessel portion and increasing chip mass lifting force created upon downward movement of the lower end of the chip mass.

3,723,244

FIBROUS FIBRIN SHEET AND METHOD FOR PRODUCING SAME

Julian P. Breillatt, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 18, 1971, Ser. No. 107,382
Int. Cl. D21h *5/20*
U.S. Cl. 162—151 **8 Claims**

Fibrin in sheet form is prepared by centrifuging an aqueous dispersion of monomeric fibrin under fibrin-polymerizing conditions. The centrifugation is conducted in a vessel having a wall for intercepting centrifuged particles and at a speed pelletizing the resulting strands of polymerized fibrin thereon. The pelletized strands interlock to form a fibrous sheet, which is removed from the vessel.

3,723,245

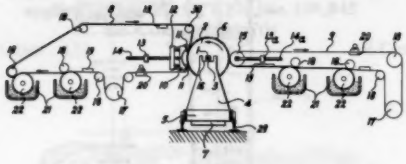
APPARATUS FOR THE PRODUCTION OF ASBESTOS-CEMENT PIPES

Auguste Blary, Paris, France, assignor to Societe Anonyme Francaise Eternit, Paris, France

Filed Dec. 21, 1970, Ser. No. 100,256
Claims priority, application France, Dec. 30, 1969, 6945452
Int. Cl. B28b *21/48, 21/90*; B31c *1/02*
U.S. Cl. 162—284 **6 Claims**

A machine for manufacturing pipes from thin layers of paste material such as asbestos-cement wherein the

layers are transferred to a rotary mandrel from at least one continuously-moving conveyor-belt by bringing the mandrel into contact with the belt along a horizontal generatrix laterally of the surface of the mandrel. The mandrel is supported by a moving carriage on a track which is parallel to the axis of the mandrel and is thus brought close to the conveyor-belts. At least one belt is applied against the mandrel by means of a pressure head which is fitted with elastic means so that the belt and



mandrel can be relatively displaced as a result of increasing thickness of the layers which are deposited on the mandrel. Multiple carriages supporting separate mandrels may be mounted on the track for movement into contact with the conveyor belt and formation of separate pipe products, the track allowing the carriages to transport the mandrels and pipes to hardening and separation stations with ultimate return of the mandrel to the conveyor-belt for additional pipe formation.

3,723,246

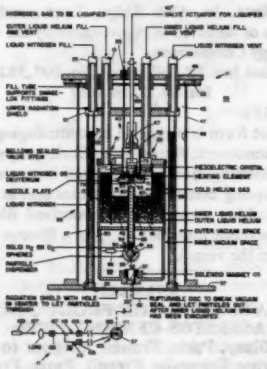
PLASMA PRODUCTION APPARATUS HAVING DROPLET PRODUCTION MEANS AND LASER PRE-PULSE MEANS

Moshe J. Lubin, Rochester, N.Y., assignor to the United States of America as represented by the United States Atomic Energy Commission

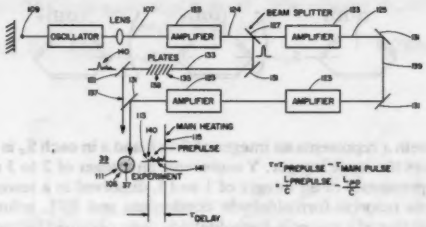
Filed May 27, 1971, Ser. No. 147,489

Int. Cl. G21b *1/00*

U.S. Cl. 176—1 **10 Claims**



Apparatus and method for producing a freely expanding high temperature plasma from a high density target that is irradiated with laser light by a tailored laser pulse. Means are described for producing a tailored laser light pulse and a tailored target for producing a laser-target



interaction. Laser-target micro-explosions are also contemplated.

3,723,247

NUCLEAR REACTOR HAVING INTERNAL PUMPS

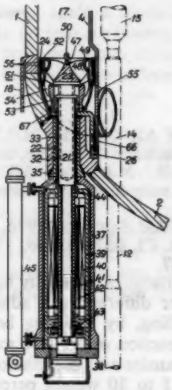
Lars Leine, Sture Gavlefors, and Olle Eriksson, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 15, 1969, Ser. No. 857,686

Claims priority, application Sweden, Sept. 24, 1968, 12,824/68

Int. Cl. G21c *15/24*

U.S. Cl. 156—50 **4 Claims**



In a boiling water reactor having coolant recirculation pumps installed within an annular space between the reactor pressure vessel and an internal core shroud, the pump motors are arranged outside the reactor pressure vessel, the pump shafts penetrate the bottom part of the reactor pressure vessel in vertical shaft bores and the pump impellers are surrounded by pump casings having curved flow passages. The pump casings are rigidly attached either to the shaft bores or to the core shroud and flexibly sealed with respect to the core shroud or the shaft bores. The pump motors may be designed to operate in the reactor coolant and be enclosed in motor housing pressure vessels communicating with the reactor vessel.

3,723,248

METHOD FOR PRODUCING α-KETOGLUTARIC ACID

Katsunobu Tanaka and Kazu Kimura, Machida-shi, and Ken Yamaguchi, Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Continuation of application Ser. No. 657,483, Aug. 1, 1967, which is a continuation-in-part of application Ser. No. 470,883, July 9, 1965, both now abandoned. This application June 13, 1968, Ser. No. 736,582

Int. Cl. C12d *1/02*

U.S. Cl. 195—28 R 15 Claims

The present disclosure relates to a method for producing α-ketoglutaric acid which comprises culturing a microorganism capable of producing α-ketoglutaric acid in an aqueous nutrient medium under aerobic conditions in the presence of at least one hydrocarbon as the main source of carbon. The microorganisms capable of producing α-ketoglutaric acid advantageously belong to the genera Corynebacterium, Brevibacterium, Arthrobacter and Micrococcus and the hydrocarbons which are used as the main source of carbon are preferably n-paraffins.

3,723,249

METHOD OF PRODUCING L-ARGININE BY MICROORGANISM

Koji Kubota and Hirotaka Kamijo, Kanagawa-ken, Takiko Onoda, Tokyo, Fumihiro Yoshinaga, Kanagawa-ken, and Shinji Okumura, Tokyo, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Feb. 12, 1971, Ser. No. 115,116

Claims priority, application Japan, Feb. 21, 1970, 45/15,108

Int. Cl. C12d *1/00*

U.S. Cl. 195—47 5 Claims

Certain bacteria of the genera Brevibacterium and Corynebacterium produce extracellularly L-arginine in amounts sufficient to warrant recovery on a commercial scale when cultured on a glucose or acetic acid medium.

3,723,250

PROTEOLYTIC ENZYMES, THEIR PRODUCTION AND USE

Knud Aunstrup, Farum; Otto Andresen, Copenhagen, and Helle Outtrup, Vaerlose, all of Denmark, assignors to Novo Terapeutisk Laboratorium A/S, Copenhagen, Denmark

Filed Sept. 23, 1968, Ser. No. 761,546

Claims priority, application Great Britain, Oct. 3, 1967, 45,046/67

Int. Cl. C12d *13/10*

U.S. Cl. 195—62 4 Claims

The invention relates to enzyme preparations containing novel proteolytic enzymes produced by cultivation of novel species of the genus Bacillus and showing useful activity at high alkalinities. The invention also relates to production of the novel proteolytic enzymes by cultivation of the novel species of the genus Bacillus in a nutrient medium having a pH-value within the range of 7 to 12. Finally the invention relates to a process of isolating the novel species referred to by effecting the isolation on nutrient media having a pH-value within the range of 9 to 11. The novel enzymes are particularly useful in detergent and dehairing compositions.

3,723,251

METHOD FOR EXTRACTING UROKINASE

Nobuhisa Ogawa, Omiya, Nobuhiko Koji, Urawa, and Yukio Murayama, Saitama, Saitama-Prefecture, Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,204

Claims priority, application Japan, Sept. 4, 1970, 45/77,389

Int. Cl. C07g *7/026*

U.S. Cl. 195—66 B 4 Claims

Acrylonitrile material is used to adsorb urokinase from a liquid, and said urokinase is subsequently eluted from said material.

3,723,252

METHOD FOR REMOVING PYROGENIC SUBSTANCES OUT OF UROKINASE

Nobuhisa Ogawa, Omiya, Nobuhiko Koji, Urawa, and Yukio Murayama, Saitama-Prefecture, Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Aug. 23, 1971, Ser. No. 174,205

Claims priority, application Japan, Sept. 5, 1970, 45/83,546

Int. Cl. C07g *7/026*

U.S. Cl. 195—66 B 2 Claims

Method of manufacturing urokinase free from pyrogenic substances by contacting crude urokinase with weakly acidic ion exchanger at an electrolyte concentration and pH value at which said urokinase is preferentially adsorbed but pyrogenic substances are not.

3,723,253

PRODUCTION OF ALPHA-1,6-GLUCOSIDASE

Yasuyuki Yokobayashi, Suita-shi, Osaka, and Kazuo Masuda, Okayama-shi, Okayama, Japan, assignors to Hayashibara Company, Okayama, Japan

No Drawing. Filed July 8, 1969, Ser. No. 840,040

Claims priority, application Japan, July 10, 1968, 43/48,273

Int. Cl. C07g *7/028*

U.S. Cl. 195—66 R 7 Claims

The production of alpha-1,6-glucosidase by the culture of an alpha-1,6-glucosidase productive bacterium is carried out by using a culture medium containing starch hydrolyzate as a carbon source and a member selected from the group consisting of soybean cake hydrolyzate and a mixture thereof with an ammonium salt as a nitrogen source.

3,723,254

PROCESS FOR PREPARING AN ANTIBIOTIC SUBSTANCE WHICH COMPRISES FERMENTING THE ORGANISM *STREPTOMYCES HAZELIENSIS*

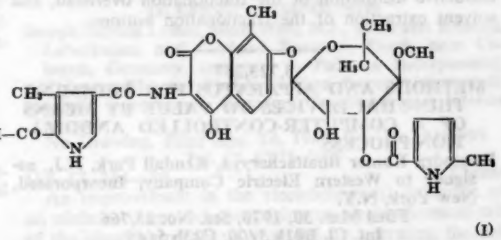
Julius Berger, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation of application Ser. No. 325,498, Nov. 11, 1963. This application July 3, 1967, Ser. No. 650,653

Int. Cl. C07c *47/18*

U.S. Cl. 195—80 4 Claims

Process for preparing a complex or mixture of antibiotic substances including a compound of the formula



(I)

which comprises fermenting the organism *Streptomyces hazeliensis* (NRRL 2938) until activity against gram-positive bacteria is obtained.

3,723,255
INCREASING OXYGEN TRANSFER INTO AQUEOUS SOLUTIONS

Cecil C. Walden and Terence E. Howard, Vancouver, British Columbia, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

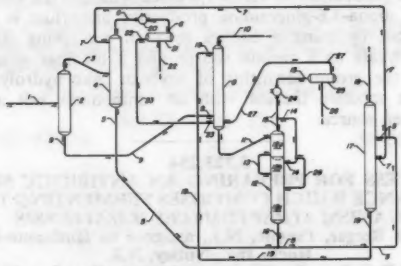
Filed May 29, 1969, Ser. No. 828,913
Int. Cl. C12b *1/14*
U.S. Cl. 195—109 **16 Claims**

The rate and efficiency of oxygen transfer into aqueous solutions is increased according to the disclosed method by first selecting a water-immiscible liquid having the properties of either a greater solubility for oxygen than has water or, for an equivalent amount of energy, allows a faster transfer of oxygen into the liquid than is transferred into water under similar conditions or both. The liquid selected is then oxygenated, brought into contact with and dispersed throughout the aqueous solution to be oxygenated and the oxygen passes from the water-immiscible liquid into the aqueous solution. The water-immiscible liquid is then separated from the aqueous solution and optionally re-oxygenated and reused. The aqueous liquid may comprise a chemical system or a microbiological system. The method is useful in increasing the oxygen supply necessary to support aerobic microbiological fermentations as used in liquid waste treatment processes.

3,723,256
AROMATIC HYDROCARBON RECOVERY BY EXTRACTIVE DISTILLATION, EXTRACTION AND PLURAL DISTILLATIONS

Herbert Lytle Thompson, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 14, 1971, Ser. No. 152,795
Int. Cl. C07c *7/08;* **B01d** *3/40*
U.S. Cl. 203—43 **12 Claims**



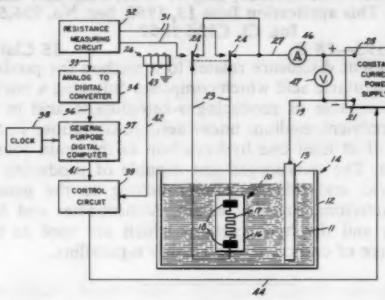
Aromatic hydrocarbons are separated from a mixture of aromatics and non-aromatics, such as a C_6–C_8 naphtha fraction, by a combination of preliminary fractionation, extractive distillation of the fractionation overhead, and solvent extraction of the fractionation bottoms.

3,723,257
METHODS AND APPARATUS FOR TRIMMING THIN-FILM DEVICES TO VALUE BY MEANS OF A COMPUTER-CONTROLLED ANODIZATION PROCESS

Ranendra Kumar Bhattacharyya, Kendall Park, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,766
Int. Cl. B01k *3/00;* **C23b** *5/48*
U.S. Cl. 204—15 **16 Claims**

A computer-controlled anodization process for trimming thin-film resistors, and the like, to value. Briefly, the initial resistance of the device to be trimmed is measured and a trial anodization conducted. Next, the resistance of the device is re-measured and the parameters of the equation characterizing the anodization process calculated. The time required to attain the desired resistance

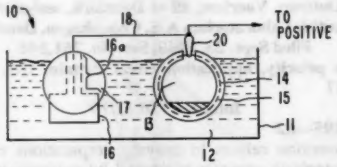


tion is terminated prior to expiration of this time intervalue is predicted from the above equation, but anodizaval. The parameters of the anodization are then re-calculated, one or more times, making adaptive changes to the algorithm used to rapidly converge the process towards the desired resistance value.

3,723,258
USE OF ANODIZED ALUMINUM AS ELECTRICAL INSULATION AND SCRATCH PROTECTION FOR SEMICONDUCTOR DEVICES

Jack F. Podell, Palo Alto, and Robert M. Whelton, Sunnyvale, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 14, 1970, Ser. No. 97,828
Int. Cl. B01k *2/02;* **C23b** *5/46, 5/48*
U.S. Cl. 204—15 **3 Claims**



Multiple layers of conductive interconnects are formed on an integrated circuit by depositing layers of a metal (typically aluminum) on the surface of the circuit and then selectively anodizing these layers to form insulation layers or layers of conductive interconnects. Masking material is used to prevent the anodization of, and thus to define, the conductive lead patterns.

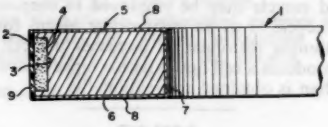
3,723,259
PROCESS OF MAKING A PISTON RING

Kouji Umezawa, Konosu, Japan, assignor to Nippon Piston Ring Kabushiki Kaisha, Tokyo, Japan

Original application Nov. 15, 1971, Ser. No. 88,320. Divided and this application Feb. 22, 1972, Ser. No. 228,054
Int. Cl. C23b *5/48*
U.S. Cl. 204—15 **3 Claims**

A cast iron piston ring is provided with a friction reducing packing of bonded iron oxide and carbon powder in a groove of its outer circumferential face, and with a hard chromium electrodeposit on all other surfaces by first

applying a packing composition including a heat curing bonding agent, thereafter coating the packing with an aqueous polytetrafluoroethylene dispersion, drying and sintering the resin into a continuous film while simultaneously curing the packing, and thereafter electrodepositing chromium, the cured packing being protected against attack by the chromium plating bath by the resin film.



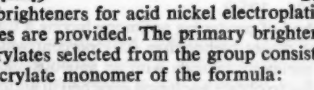
3,723,260
ACID NICKEL ELECTROPLATING

John Derek Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 15, 1972, Ser. No. 226,543
Int. Cl. C23b 5/08, 5/46
U.S. Cl. 204—49 20 Claims

Primary brighteners for acid nickel electroplating baths and processes are provided. The primary brightener additives are acrylates selected from the group consisting of

(1) an acrylate monomer of the formula:



wherein

R is methyl or hydrogen,
n is a positive whole integer of 1 to 3 inclusive,
R′ is alkyl of 1 to 4 carbon atoms,
R″ is alkyl of 1 to 4 carbon atoms,

$-CH_2CH=CH_2$

$-CH_2C\equiv CH$, $-CH_2COOCH_3$,

$-CH_2COOC_2H_5$

$-CH_2COR$ where R is as defined above, $-CH_2CONH_2$, $-CH_2CN$, $-CH_2CH_2OH$, $-CH_2CH_2COO^-$ or $-CH_2CH_2CH_2SO_3^-$ and X⁻ is $CH_3SO_4^-$, $C_2H_5SO_4^-$, halide or is absent when R″ is $-CH_2CH_2COO^-$ or

$-CH_2CH_2CH_2SO_3^-$

(2) a homopolymer of said acrylate monomer, and
(3) a copolymer of said acrylate monomer with at least one ethylenically unsaturated monomer selected from the group consisting of an α,β-ethylenically unsaturated monocarboxylic acid, an alkyl ester of said acid wherein the alkyl group is from 1 to 4 carbon atoms, acrylonitrile, acrylamide, methacrylamide, vinyl acetate, vinyl sulfone and vinyl pyridine, the molar ratio of said acrylate monomer to said unsaturated monomer being within the range of 0.9:0.1 to 0.1:0.9.

3,723,261
BLACK CHROMIUM PLATING PROCESS AND COMPOSITION

Robert D. Byers, Syracuse, N.Y., and Winslow H. Hartford, Charlotte, N.C., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,701
Int. Cl. C23b 5/06, 5/48
U.S. Cl. 204—51 14 Claims

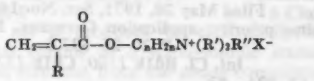
Black chromium plated articles are produced by the use of a novel electroplating bath, wherein a light and heat absorbing decorative and protective electroplate is applied to a basis metal or other conductive substrate. The bath comprises chromic acid, sodium or potassium ions, fluosilicate ions and an organic reducing agent.

3,723,262
ACID ZINC ELECTROPLATING

John Derek Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1972, Ser. No. 226,542
Int. Cl. C23b 5/12, 5/46
U.S. Cl. 204—55 R 20 Claims

Brightening additives for acid zinc electroplating baths and processes are provided. The additive is an acrylate selected from the group consisting of (1) an acrylate monomer of the general formula:



wherein

R is methyl or hydrogen,
R′ is alkyl of one to four carbon atoms,
n is a positive whole integer of 1 to 3, inclusive,
R″ is alkyl of one to four carbon atoms, $-CH_2CH=CH_2$, $-CH_2C\equiv CH$, $-CH_2COOCH_3$, $-CH_2COOC_2H_5$, $-CH_2COR$ where R is as defined above, $-CH_2CONH_2$, $-CH_2CN$, $-CH_2CH_2OH$, $-CH_2CH_2COO^-$ or $-CH_2CH_2CH_2SO_{3^-}$, and
X⁻ is $CH_3SO_4^-$, $C_2H_5SO_4^-$, halide or is absent when R″ is $-CH_2CH_2COO^-$ or $-CH_2CH_2CH_2SO_3^-$;

(2) a homopolymer of said acrylate monomer and (3) a copolymer of said acrylate monomer with at least one ethylenically unsaturated monomer selected from the group consisting of an α, β-ethylenically unsaturated monocarboxylic acid, and alkyl ester of said acid wherein the alkyl group is from one to four carbon atoms, acrylonitrile, acrylamide, methacrylamide, vinyl acetate, vinyl sulfone and vinyl pyridine, the molar ratio of said acrylate monomer to said vinyl monomer being within the range of 0.9:0.1 to 0.1:0.9.

3,723,263
COMPOSITION OF BATHS FOR ELECTRODEPOSITION OF BRIGHT ZINC FROM AQUEOUS, ACID, ELECTROPLATING BATHS

William E. Rosenberg, Parma, Ohio, assignor to R. O. Hull & Company, Inc., Cleveland, Ohio

Filed Feb. 25, 1972, Ser. No. 229,590
Int. Cl. C23b 5/12, 5/46
U.S. Cl. 204—55 R 4 Claims

It has been found that upon addition to an aqueous, acid, zinc electroplating bath, naphthol polyoxyalkylate and polyethylenimine act synergistically to provide smooth, bright, ductile, electrodeposits of zinc.

3,723,264
ELECTROCHEMICAL OXIDATION OF OLEFINIC COMPOUNDS

Joseph-Adrien Leduc, Short Hills, N.J., and Peter Konrad, Leverkusen, and Gerhard Troemel, Pesch, near Cologne, Germany, assignors to Pullman Incorporated, Chicago, Ill., and Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany, fractional part interest to each

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,999
Int. Cl. C07b 3/00
U.S. Cl. 204—80 22 Claims

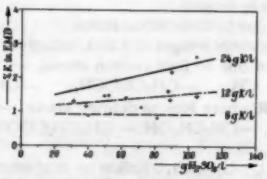
An improvement in the electrochemical oxidation of an olefinic compound comprising an electrochemical cell of the diaphragm type is provided by operating the cell with a diaphragm comprising asbestos as a diaphragm matrix combined with a high molecular weight polymer as a binder. The matrix is an asbestos of the serpentine

or amphibole type while the binder comprises at least one of a group of certain polymeric compounds of the type including synthetic rubbers, and thermoplastic and thermosetting polymers and copolymers of hydrocarbon and substituted hydrocarbon compounds. The polymeric material incorporated into the asbestos matrix glues or binds the fibers of the asbestos in a linked or glued structure to strengthen the diaphragm and prevent rupture during continuous operation of the cell.

3,723,265
ELECTROLYTIC PRODUCTION OF MANGANESE DIOXIDE

Eberhard Preisler, Knapsack, Heinz Harnisch, Lovenich, and Gerhard Mietens, Efferen, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed May 20, 1971, Ser. No. 145,331
Claims priority, application Germany, May 30, 1970, P 20 26 597.8
Int. Cl. B01k *1/00*; C01b *13/14*
U.S. Cl. 204—83 **6 Claims**



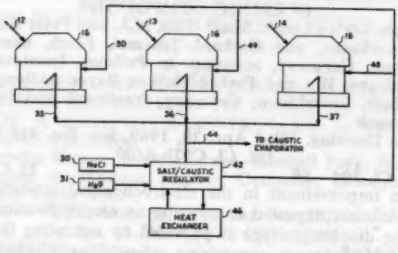
Influence of the Sulfuric Acid Concentration on the Incorporation of Potassium in the Lattice of Electrolytic Manganese Dioxide (EMD) at Different Potassium-Ion Concentration in the Electrolyte

Electrolytic production of manganese dioxide from an electrolyte consisting substantially of manganese-II-sulfate solutions in sulfuric acid. Manganese dioxide of which between 5 and 100 percent is α-modification of MnO_2, the balance being γ-modification of MnO_2, is produced with the use of an electrolyte containing potassium ions in a concentration of 1 gram/liter up to the saturation concentration, and free sulfuric acid in a concentration of between 20 and 150 grams/liter. These concentrations are maintained during electrolysis.

3,723,266
CATHOLYTE RECIRCULATION IN DIAPHRAGM CHLOR-ALKALI CELLS

John E. Currey, Lewiston, and Walter W. Ruthel, Niagara Falls, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Original application Sept. 23, 1968, Ser. No. 761,752. Divided and this application Nov. 12, 1970, Ser. No. 89,102
Int. Cl. C01d *1/06*
U.S. Cl. 204—98 **7 Claims**



The caustic concentration, and salt-caustic ratio of catholyte is requlated by addition of an alkali metal chloride and/or water to withdrawn cell liquor. The temperature of the cell liquor is regulated as desired and an amount of the idealized cell liquor is returned to the cathode compartment of the cell which is approximately one-third to ten times the volume of catholyte withdrawn in the absence of recirculated catholyte. The cell liquor treatment and recycle may be employed in conjunction with anolyte recycle or as an independent means for cell control. Catholyte recirculation increases the cell efficiency and/or produces a cell liquor with a higher caustic concentration than is obtained conventionally.

3,723,267
METHOD OF PRODUCING HIGH PURITY ANTIMONY FROM ANTIMONY TRIOXIDE OBTAINED BY BURNING REFINED METAL

Pavel Petrovich Balborodov, Tashkent; Alexandra Vasilievna Uvarova; Ivan Konstantinovich Gerasimov, both of Oshskaya oblast; Alexandr Borisovich Ezhkov, Tashkentskaya oblast Almalyk, and Nikolai Arkadievich Kolbin, Oshskaya oblast, all of U.S.S.R., assignors to Sredneaziatsky Nauchno-Isseldovatelsky I. Proektny Institut Tsvetnoi Metallurgii, Tashkentaskaya ablast, U.S.S.R.

Filed Jan. 5, 1971, Ser. No. 104,168
Int. Cl. C22d *1/00*
U.S. Cl. 204—105 R **8 Claims**

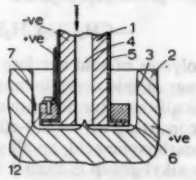
A method of producing antimony having a total amount of impurities of not higher than 0.01 percent which comprises treating antimony trioxide with an aqueous alkaline solution of glycerine to obtain a solution enriched in antimony and subjecting the solution to electrolysis whereby high-purity antimony is electrodeposited on a cathode.

This method makes possible an increase in the extraction of high purity antimony by as much as 30 percent.

3,723,268
ELECTROCHEMICAL MACHINING

Antony Johns, Melton, Mowbray, Michael Tiley, Keyworth, and Patrick J. McDonnell, Burton-on-the-Wold, England, assignors to Production Engineering Research Association of Great Britain, Melton, Mowbray, England

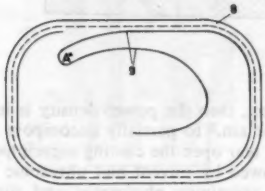
Filed Dec. 20, 1968, Ser. No. 785,559
Claims priority, application Great Britain, Dec. 21, 1967, 58,124/67; May 8, 1968, 21,874/68
Int. Cl. B23p *1/00*; B23k *9/16*
U.S. Cl. 204—129.1 **18 Claims**



Methods of electrochemical machining in which stray machining is inhibited and a high feed rate and a constant working gap can be achieved. Stray machining is inhibited by a protective electrode provided on the cathodic tool and maintained at a positive electrical potential relative to the tool to confine electrical current flow between the tool and an anodic workpiece to regions where erosion is desired. High feed rates are achieved by appropriate tapering of a machining land on the tool. Constant working gaps are achieved by normalizing the machining voltage with the aid of voltage sensing probes, by controlling the conductivity of the electrolyte or by

forming stable globules of electrolyte in a dielectric carrier liquid, the globules having a diameter matching the desired gap.

3,723,269
METHOD OF PRODUCING TEARING LINES IN METAL CONTAINERS
Erich Hofling, Kreuzlingen, Switzerland, assignor to Swiss Aluminium Ltd., Chipps, Switzerland
Filed Apr. 6, 1971, Ser. No. 131,636
Int. Cl. C01b *13/04*
U.S. Cl. 204—129.65 **7 Claims**



Disclosed is a method of continuous production of tearing notches in metal cans. A continuously advancing metal material for the cans is first provided with an insulating mask having channels corresponding to the desired pattern of the tearing lines. The uncovered metal surface portion in the channels is subjected to a controllable electrochemical etching process.

3,723,270
PROCESS FOR PRODUCING A COPOLYMER OF TETRAFLUOROETHYLENE AND PROPYLENE USING RADIATION AND A SOLVENT
Yoneho Tabata, Matsudo Chiba, and Gen Kojima, Tokyo, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan
No Drawing. Filed Dec. 11, 1970, Ser. No. 97,386
Int. Cl. C08d *1/00;* **C08f** *1/16*
U.S. Cl. 204—159.22 **4 Claims**

Copolymers of tetrafluoroethylene and propylene are prepared in a non-polymerizable medium of a solvent or swelling agent, using high energy ionizing radiation.

3,723,271
PRODUCTION OF 4,5-EPOXY-2-PENTENAL FROM CYCLOPENTADIENE USING ACTINIC LIGHT
Karl-Heinrich Schulte-Elte, Chatelaine, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland
No Drawing. Original application July 25, 1969, Ser. No. 845,101, now Patent No. 3,644,430. Divided and this application June 21, 1971, Ser. No. 155,332
Claims priority, application Switzerland, July 29, 1968, 11,323/68
Int. Cl. B01j *1/10*
U.S. Cl. 204—162 R **6 Claims**

4,5-epoxy-2-penten-1-al, which is useful as an intermediate in various organic syntheses, is disclosed together with a process for its preparation which comprises oxidizing cyclopentadiene by means of singlet oxygen.

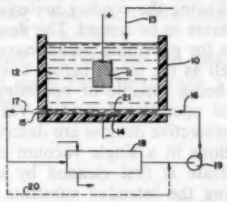
3,723,272
PREPARATION OF OCTACHLOROCYCLOPENTENE USING ULTRAVIOLET LIGHT
Stephen Robota, North Tonawanda, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Oct. 26, 1971, Ser. No. 192,628
Int. Cl. B01j *1/10*
U.S. Cl. 204—163 R **4 Claims**

Octachlorocyclopentene is prepared from dicyclopentadiene by a simple and direct, two-stage, chlorination process. The first stage provides for depolymerizing the dicyclopentadiene dimer by thermocracking, and thereafter chlorinating with an excess of chlorine under a heel of chlorinated cyclopentadiene to form polychlorocyclopentanes containing between 4 and 5 chlorine atoms. The second stage provides for the further chlorination of the polychlorocyclopentanes to octachlorocyclopentenes at constant temperature and with an excess of chlorine. Provision is made therein for the chlorination in both stages by both non-catalytic and catalytic methods.

3,723,273
ELECTRODIALYTIC PRODUCTION OF STANNIC OXIDE SOL
Harold P. Wilson, Sewickley, Pa., assignor to Vulcan Materials Company, Birmingham, Ala.
No Drawing. Filed Sept. 24, 1971, Ser. No. 183,713
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 P **8 Claims**

Stannic oxide sol is produced by electrodialytically transferring metal cations of a water-soluble stannate, such as potassium stannate, from the anode compartment of an electrolytic cell to the cathode compartment while simultaneously substantially preventing migration of tin anions from the anode compartment to the cathode compartment by maintaining a cation permselective dialytic membrane between the anode and the cathode.

3,723,274
METHOD OF ELECTROCOATING USING A FLOWING MERCURY CATHODE
Lowell G. Wise, Cleveland, Ohio, assignor to The Sherwin-Williams Company, Cleveland, Ohio
Filed Oct. 30, 1970, Ser. No. 88,038
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—181 **7 Claims**



Process and apparatus for anodically electrodepositing a resin film from an aqueous bath of a water-dispersible polycarboxylic acid resin with an alkali metal hydroxide dispersal agent using a flowable liquid mercury cathode. Alkali metal ions are removed from the aqueous coating bath by cathodic deposition, while the resin is deposited on a metal anode. Mercury and alkali metal values from the amalgam are recovered for reuse.

3,723,275
DUAL FEED SYSTEM FOR ELECTROCOATING BATH
William Bonfich, Parma, Ohio, and James C. Hoffman, Jamesburg, N.J., assignors to Mobil Oil Corporation
No Drawing. Filed Mar. 15, 1971, Ser. No. 124,604
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 **6 Claims**

An aqueous emulsion electrocoating bath is maintained by separately supplying: (1) an oil-in-water emulsion having an emulsified phase comprising water insoluble organic solvent having disssolved therein an at least partially esterified resinous polyol and a continuous phase comprising water and resinous polycarboxylic acid emulsifying agent in partially neutralized base-deficient condi-

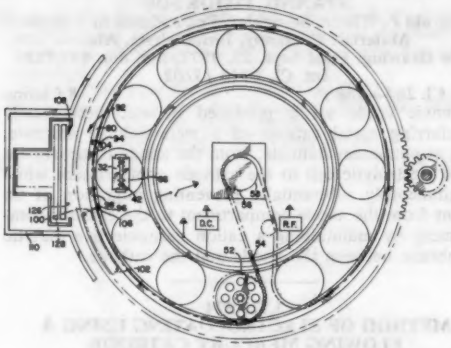
tion; and (2) a pigmented, base-satisfied, water-bearing and water reducible solution comprising resinous emulsifying agent dissolved in water miscible organic solvent.

3,723,276

ARTICLE COATING METHOD

George C. Lane, Danbury, Cyril A. Cartwright, Monroe, and Keith W. Ehnslie, Guilford, Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed June 3, 1969, Ser. No. 829,906
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **9 Claims**



An apparatus and method for coating articles or substrates, particularly razor blades or other cutting instruments, in which means are provided for establishing a radio frequency alternating electrical field between electrodes within a vacuum chamber for sputtering a coating from a target having the coating material thereon to the article, or substrate to be coated. The described apparatus includes means for providing preliminary cleaning of the substrate as well as the target before coating, such cleaning operation being capable of operating in any one of several different operational modes. Various mechanical handling and protective devices are described for carrying out the operations in a single vacuum chamber. Preferably, the substrate is first cleaned by so-called reverse sputtering (using the intended substrate as a target) or glow discharge cleaning, or sputter etching, then protected against contamination while the target is cleaned, with the substrate thereafter being exposed to coating by sputtering. In another embodiment, simultaneous substrate cleaning and deposition takes place, as the target and the substrate are maintained at different potentials while having radio frequency alternating voltages impressed thereon. The apparatus provides a means of performing these operations either simultaneously or in sequence on a plurality of articles at one or more stations without breaking the vacuum in the evacuated chamber, or allowing contamination of the article, substrate or target between cleaning and coating operations.

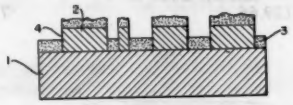
3,723,277

METHOD FOR THE PRODUCTION OF MASKS IN THE MANUFACTURE OF SEMICONDUCTOR COMPONENTS

Werner Schmiedecke, Dresden, Germany, assignor to Arbeitsstelle fur Molekularelektronik, Dresden, Germany

Continuation-in-part of abandoned application Ser. No. 794,663, Jan. 28, 1969. This application July 14, 1971, Ser. No. 163,546
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **9 Claims**

In a process for the production of masks in the manufacture of semiconductor components, onto a coated or uncoated semiconductor substrate is sputtered a composition containing a silicon oxide or nitride compound at a power density no greater than about 0.2 watt per cm.^{2} until a coating thickness of at least 0.1 μm. is attained and then at a power density no greater than about 0.4 watt per cm.^{2} until the coating has attained a thickness



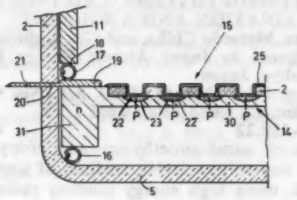
of 0.3 to 2.0 μm., then the power density is increased to 3 to 5 watts per cm.^{2} to partially decompose the photoresist mask and tear open the coating superimposed thereon; this is followed by solvent and ultrasonic treatments to remove the remaining photoresist and superimposed coating.

3,723,278

METHOD OF DEPOSITING HAFNIUM-TANTALUM NITRIDE LAYER BY REACTIVE SPUTTERING

Richard B. Liebert and Thomas H. Conklin, Ridgefield, Conn., assignors to North American Philips Corporation, New York, N.Y.

Filed July 30, 1971, Ser. No. 167,633
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **2 Claims**



A hafnium-tantalum nitride layer having a composition between the mononitride and the dinitride 500–5000 A. thick is deposited on an oxidized silicon substrate in an argon atmosphere containing nitrogen at a partial pressure of $5–10\times10^{-3}$ torr by RF sputtering of hafnium mononitride and tantalum mononitride. After subsequent annealing such layers have sheet resistivities of at least 2×10^{13} ohms/□ and are particularly suited as an electron discharge layer on the oxide surface of a silicon vidicon target wafer, i.e. as a resistive sea.

3,723,279

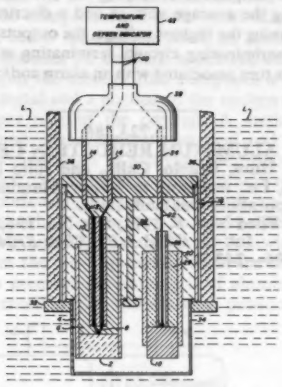
APPARATUS FOR OXYGEN DETERMINATION

Richard J. Fruehan, Franklin Township, Westmoreland County, and Ethem T. Turkdogan, Pittsburgh, Pa., assignors to United States Steel Corporation

Continuation-in-part of application Ser. No. 727,314, May 7, 1968. This application May 21, 1970, Ser. No. 39,530
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 S **10 Claims**

A device for measuring oxygen content of fluids at elevated temperature comprises a galvanic cell with a solid oxide electrolyte and a reference electrode of a mixture of chromium or an alloy thereof and Cr_2O_3. When the

fluid, acting as the other electrode, contacts the electrolyte, the resulting EMF indicates oxygen content. Provision is



also made for simultaneous temperature determination and for electrical contact with fluids, such as liquid steel.

3,723,280

ELECTRODE ARRANGEMENT FOR THE MEASUREMENT OF PARTIAL PRESSURES OF GASES

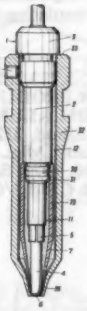
Karl Harnoncourt, and Rudolf Zeiringer, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Nov. 25, 1970, Ser. No. 92,683

Claims priority, application Austria, Dec. 4, 1969, A 11343/69; Sept. 3, 1970, A 8040/70

Int. Cl. G01n *27/30, 27/40*

U.S. Cl. 204—195 P **5 Claims**



An electrode arrangement for the measurement of partial pressures of gases such as carbon dioxide and oxygen for analysis of blood gases and in which the electrode has a sensitive extremity covered by a liquid-proof membrane permeable to gases and a reference electrode arranged in spaced relation to the sensitive extremity and electroconductively connected therewith by means of an electrolytic layer.

3,723,281

BICARBONATE ION SENSITIVE ELECTRODE

Warren M. Wise, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jan. 31, 1972, Ser. No. 222,023

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 L **3 Claims**

Electrode for measuring the concentration of bicarbonate ions in the presence of chloride ions in an aqueous solution. The ion sensing portion of the electrode is an organic solution consisting of a high molecular weight quaternary ammonium salt dissolved preferably in a dual solvent system consisting of a trifluoroacetyl-p-alkylbenzene and an alcohol of low water solubility. The preferred electrode has a selectivity for HCO_3^- over Cl^- of between about 15 to 1 and 40 to 1.

3,723,282

EXTRUDED CONSUMABLE ANODES WITH ANODIZED CORE-CLADDING INTERFACE

John F. Pashak, Linwood, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,305

Int. Cl. C23f *13/00*

U.S. Cl. 204—197 **10 Claims**

An extrusion process for forming consumable anodes and the product produced therein. The process comprises the co-extrusion of a wire core having a non-ferrous light metal surface with an overcoating of a dissimilar light metal. A synthetically produced non-ferrous metal oxide layer is interposed between the dissimilar light metal surfaces to reduce the incidence of core wire breakage during extrusion operations. It is believed that alloying of the light metal core surface with the dissimilar extruded overcoating is inhibited by the oxide layer, thereby substantially eliminating adherence of a low melting, non-ferrous alloy to the extrusion die. Breakage of the core wire during extrusion is thereby minimized.

3,723,283

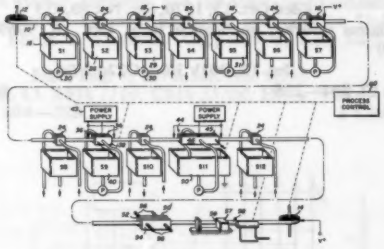
SELECTIVE PLATING SYSTEM

Frank J. Johnson, San Jose, Nelson L. Walker, Saratoga, and John P. Ross, Cupertino, Calif., assignors to Select-Au-Matic, Santa Clara, Calif.

Filed Dec. 23, 1970, Ser. No. 100,915

Int. Cl. B01k *3/00;* **B23p** *1/02, 1/12*

U.S. Cl. 204—206 **15 Claims**



A selective plating system in which a continuous strip or web of work material is passed through the system without deformation and selected discrete areas of the web surface may be uniformly plated without the use of adhesive masks or other techniques heretofore utilized. The system includes several stations through which the web is drawn in order to perform the required cleaning, rinsing and electroplating operations. The system also includes a novel electrolyte handling structure which engages the web to mask off those surface areas not to be plated and which causes the electrolyte to be passed in flowing relationship with the discrete areas to be plated.

3,723,284

INDEX COMMUTATOR MEANS FOR OSCILLATING BARRELS

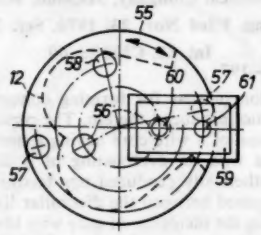
Paul E. Ziebarth, Hillegossen, and Reinhold Ritter, Herford-Elverdissen, both of Germany, assignors to Langheim & Co., Heepen b. Bielefeld, Germany

Filed May 20, 1971, Ser. No. 145,254

Claims priority, application Germany, Feb. 11, 1971, P 21 06 544.1

Int. Cl. 259 *89;* **C23b** *5/78*

U.S. Cl. 204—213 **12 Claims**



A galvanizing device comprising a pivoted drum to hold workpieces, means for rocking the drum to a limited extent, a carrying frame in which the drum is pivoted, pierced longitudinal walls of plastics material within the drum the cross-section of the walls being partially heart-shaped, longitudinal strengthening bars attached to the walls and to the ends of the drum, the bars carrying partially exposed current-carrying contact rods, and connections from the rods to a low-voltage high current electric supply. The drum dips into a vat containing treatment liquid which penetrates the holes in the walls and contacts the workpieces in the drum.

3,723,285

SYSTEM FOR PROTECTING ELECTROLYTIC CELLS AGAINST SHORT CIRCUITS

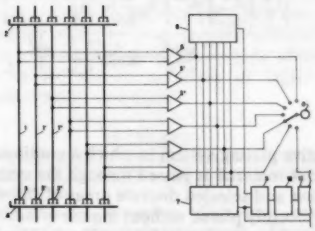
Giorgio Abbate Daga, Lino Cerrocchi, and Pietro Fracassi, all of Milan, Italy, assignors to Montecatini Edison S.P.A.; Guardigli S.P.A., both of Milan, Italy

Filed Oct. 13, 1970, Ser. No. 80,433

Claims priority, application Italy, Oct. 16, 1969, 23449 A/69

Int. Cl. B01k *3/00;* **C22d** *1/04*

U.S. Cl. 204—228 **18 Claims**



A device for protecting electrolytic cells against short circuits, having an operational amplifier for each of the ascent bars of said cells, said amplifiers having adjustable gain and being supplied through difference inputs with voltage falls picked up on said bars, circuits being included for compensating the effects due to temperature variations of the bars as well as circuits for the rejection of the common mode voltages due to anodic transversal voltages, the output voltages from said operational amplifiers supplying an averaging circuit for determining the average voltage and a discriminating circuit for determining the highest voltage, the outputs of said averaging and discriminating circuits terminating at a comparator circuit in its turn associated with an alarm and/or control unit.

3,723,286

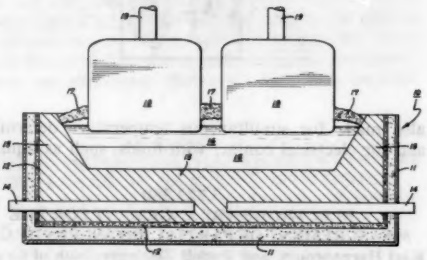
ALUMINUM REDUCTION CELL

Leland F. Hunt, Diablo, Calif., and Julio R. Lago, New Orleans, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 8, 1971, Ser. No. 196,337

Int. Cl. C22d *3/02;* **B01k** *3/04*

U.S. Cl. 204—243 R **10 Claims**



The distortion of the carbonaceous cathode lining of an aluminum reduction cell is substantially reduced by incorporating a layer of salt selected from the group consisting of the chloride and fluoride salts of sodium, lithium, calcium and maganesium between the carbonaceous lining and the insulating layer of refractory material.

3,723,287

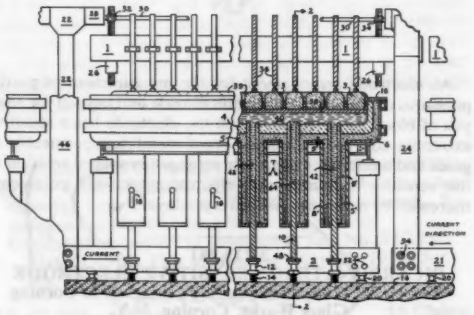
APPARATUS FOR PRODUCING ALUMINUM FROM ALUMINA

Charles Henry Elliott, 212 Jeff Davis Ave., Waveland, Miss. 39576

Filed Sept. 30, 1970, Ser. No. 76,915

Int. Cl. C22d *3/02, 3/12*

U.S. Cl. 204—243 R **12 Claims**



Apparatus for alumina reduction comprising substantially vertical cathodes, eliminating previous leaching of

iron into the molten aluminum from horizontal cathodes in the crucible, and the previous wave-like distortions (ridging and motoring) of this aluminum caused by magnetic forces from the horizontal cathodes. The composite vertical cathode comprises: an outer steel tube, fixed to and extending below the crucible shell; an inner carbonaceous hollow member or conduit; a central, current-conducting means in the conduit that comprises a lower rod of conductive metal and a portion of the molten aluminum within an upper part of the conduit. A method is disclosed that comprises dropping a vertical rod of aluminum or copper downward in and thru the cathode hollow member, to rest on a resilient base. When this rod is aluminum it preferably extends well above an outlet tap in the conduit; when of copper its upper end is below the tap. The method also comprises withdrawing molten aluminum from the tap—optionally from the temporarily capped hollow member (in purging it of alumina sludge) or from the crucible (in withdrawing produced aluminum).

3,723,288

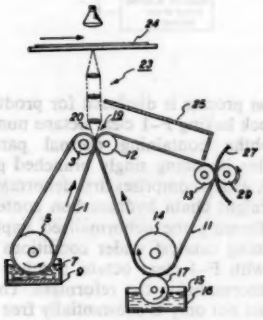
ELECTROPHORETIC IMAGING APPARATUS INCLUDING MEANS TO PROJECT AN IMAGE AT A LIQUID NIP

John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of application Ser. No. 760,311, Sept. 17, 1968. This application Jan. 6, 1971, Ser. No. 104,332

Int. Cl. B01k *5/02*

U.S. Cl. 204—300 **5 Claims**



A photoelectrophoretic imaging system and apparatus are described wherein electrically photosensitive particles dispersed in a carrier liquid are subjected to an electric field and exposed to imagewise light causing selective particle migration in image configuration. The imagewise exposure is directed at a liquid nip of the particle-liquid suspension. The exposure is not directed through either nip forming surface.

3,723,289

METHOD AND APPARATUS FOR PLASMA TREATMENT OF SUBSTRATES

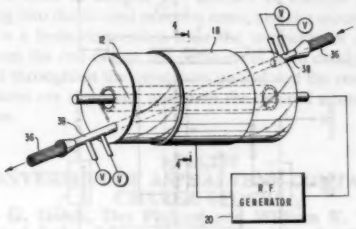
Abraham A. Boom, Martinsville, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 12, 1971, Ser. No. 171,282

Int. Cl. H01t *19/00*

U.S. Cl. 204—312 **18 Claims**

A method and apparatus for efficiently generating a gaseous plasma particularly for the treatment of substrates. A radio frequency electrical signal is applied to two electrodes disposed exteriorly of an electrically insulative, gas impervious envelope. A central passage extends into the envelope and one electrode is disposed in the central passage. The electrodes are separated at least in part by the envelope and the radio frequency signal applied to the electrodes excites the gas within the envelope to thereby generate a gaseous plasma therein. The gas conditions within the envelope differ from the gas conditions exteriorly thereof and the amplitude of the radio frequency signal is insufficient to generate a plasma outside the chamber defined by the envelope. Since the plasma does not contact the electrodes, efficiency is maximized and the plasma is not contaminated by the electrodes. In addition, the surface areas of the electrodes differ substantially thereby creating a plasma within the envelope which varies in concentration in a predetermined manner, with the concentration being greatest near the center of the envelope. A substrate may therefore be contacted by varying plasma concentration as it passes through the envelope and the outer wall of the envelope is not contaminated by the plasma. A vacuum lock for preventing gas leakage into the envelope is also disclosed.



3,723,290

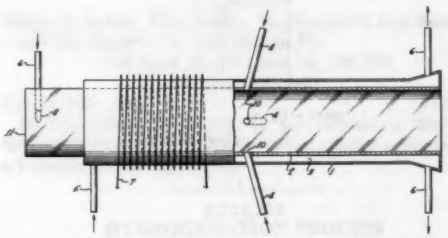
HIGH TEMPERATURE CHEMICAL REACTION APPARATUS

Stephen Mark Lesley Hamblyn, Long Ditton, Anthony Patrick Money, Surbiton, and Ian Malcolm MacKinnon, Kingston-upon-Thames, England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Jan. 7, 1970, Ser. No. 1,195

Int. Cl. B01k *1/00;* **C01b** *35/00;* **H05b** *7/00*

U.S. Cl. 204—328 **3 Claims**



Improvement in plasma generating apparatus in which the plasma-generating zone and downstream reaction zone are cooled by a cooling jacket surrounding the walls of the reaction vessel.

3,723,291

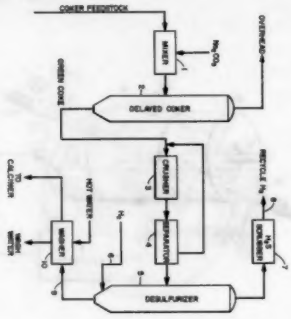
PROCESS FOR DESULFURIZING COKE

Mahendra T. Thakker, Ponca City, Okla., assignor to Continental Oil Company, Ponca Cit, Okla.

Continuation-in-part of Ser. No. 799,150, Feb. 10, 1969, abandoned. This application April 16, 1971, Ser. No. 134,909

Int. Cl. C10g 9/14; C10b 57/00

U.S. Cl. 208—46 7 Claims



Petroleum coke of reduced sulfur content is produced by adding an alkali metal carbonate (preferably sodium carbonate) to the coker feedstock prior to coking and then, after coking, treating the coke with hydrogen at an elevated temperature.

3,723,292

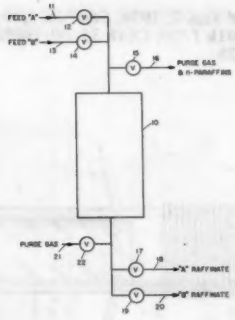
REMOVAL OF STRAIGHT CHAIN HYDROCARBONS FROM DIFFERENT HYDROCARBON STOCKS

Alfred J. Glessner, Glenolden, Pa., and William Wayne Wentzheimer, Edgewood, Md., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 24, 1971, Ser. No. 174,322

Int. Cl. C10g 25/04, 1/00, 35/18

U.S. Cl. 208—85 8 Claims



A cyclic process is disclosed for sequentially treating two different naphtha stocks in the same molecular sieve adsorption bed to produce nonstraight chain hydrocarbon fractions respectively from each stock and a third product composed of straight chain hydrocarbons from both stocks. Also disclosed is the use of this procedure in conjunction with a reforming process wherein a naphtha feed is first denormalized, the denormalized naphtha is reformed and the resulting reformate is denormalized to yield high octane gasoline blending stock.

3,723,293

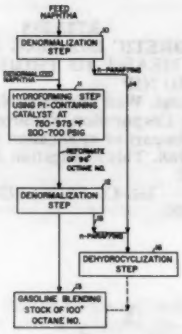
PROCESS FOR PRODUCING GASOLINE BLENDING STOCK OF HIGH ANTIKNOCK VALUE

Alfred J. Glessner, Glenolden, Pa., William Wayne Wentzheimer, Edgewood, Md., and René F. Kress, Media, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 112,140, Feb. 3, 1971. This application Nov. 18, 1971, Ser. No. 200,061

Int. Cl. C10g 35/08

U.S. Cl. 208—85 14 Claims


FEED NAPHTHA
DENORMALIZATION STEP
HYDROFORMING STEP USING Pt-CONTAINING CATALYST AT 750-975 °F 200-700 PSIG
DENORMALIZATION STEP
DEHYDROCYCLIZATION STEP
GASOLINE BLENDING STOCK OF 100 OCTANE NO.

A combination process is disclosed for producing gasoline blending stock having F–1 clear octane number above 100 from naphtha containing normal paraffins and branched paraffins including singly branched paraffins of the C_6–C_9 range, which comprises first denormalizing (i.e., reducing the straight chain hydrocarbon content of) the naphtha, hydroforming the denormalized naphtha via a platinum-containing catalyst under conditions yielding a C_{5+} reformate with F–1 clear octane number of at least 96, and then denormalizing the reformate. The resulting reformate product not only is substantially free of straight chain hydrocarbons but also, due to this sequence of processing, has an unusually low content of singly branched paraffins of the C_6–C_9 range, which components have poor octane values. Preferably the two denormalization steps are effected by molecular sieve adsorbents. Straight chain hydrocarbons desorbed from the adsorbent in these steps may be dehydrocyclized to increase the yield of high octane gasoline blending stock.

3,723,294

CONVERSION OF ASPHALTENE-CONTAINING HYDROCARBONACEOUS CHARGE STOCKS

John G. Gatsis, Des Plaines, and William K. T. Gleim, Island Lake, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

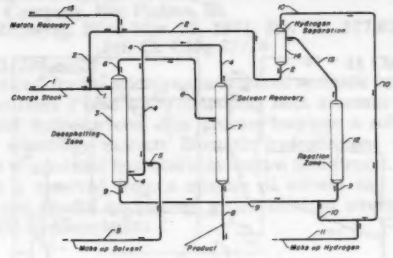
Filed Oct. 18, 1971, Ser. No. 190,021

Int. Cl. C10g 37/00

U.S. Cl. 208—86 10 Claims

A combination process for effecting the conversion of asphaltene-containing black oils. The charge stock, in admixture with non-stoichiometric vanadium sulfide, and

unreacted asphaltenes, is initially subjected to solvent deasphalting to provide a solvent-lean mixture of the



vanadium sulfide and the precipitated asphaltenes. This mixture is subsequently reacted with hydrogen to convert the asphaltenes into lower-boiling hydrocarbon products.

3,723,295

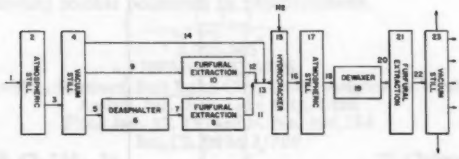
HYDROCRACKING PRODUCTION OF LUBES

Rene F. Kress, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Continuation-in-part of application Ser. No. 743,915, July 3, 1968. This application Aug. 17, 1970, Ser. No. 64,656

Int. Cl. C10g *37/00*

U.S. Cl. 208—87 **18 Claims**



A process for prevaring high V.I. lube oils of improved quality comprising solvent extracting at least part of the lube oil hydrocracker charge stock with a solvent having preferential solubility for aromatics, for example, furfural; hydrocracking the raffinate from said extraction under conditions providing for an increased V.I. of said raffinate.

Quality is further enhanced by serially extracting the hydrocracked products with a solvent having preferential solubility for aromatics, such as furfural, under conditions providing for highly selective removal of color bodies, color body precursors, U.V. adsorbing compounds and sludge precursors.

Alternatively, the quality of the hydrocracked product may be further enhanced by selectively hydrogenating same at relatively severe lube hydrogenation conditions whereby color bodies, color body precursors, U.V. adsorbing compounds and sludge precursors are mitigated.

3,723,296

HYDROCONVERSION OF PETROLEUM OILS

Frederick K. Hahn, Port Arthur, Tex., assignor to Texaco, Inc., New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,259

Int. Cl. C10g *23/00*

U.S. Cl. 208—89 **13 Claims**

In a dual catalyst system such as a petroleum oil hydrotreating - hydrocracking combination in which the first reaction zone is used to control the amount of catalyst deactivant passing into the second reaction zone, and the second reaction zone is a hydroconversion zone the temperature differential between the end-of-run temperature of each catalyst is maintained throughout the on-stream period and the reaction temperatures are regulated to obtain the desired amount of conversion.

3,723,297

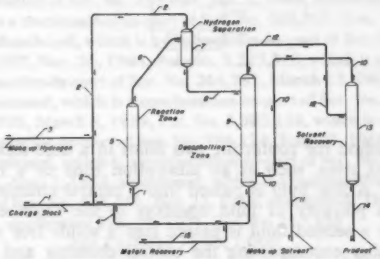
CONVERSION OF ASPHALTENE-CONTAINING CHARGE STOCKS

John G. Gatsis, Des Plaines, and William K. T. Gleim, Island Lake, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 18, 1971, Ser. No. 190,022

Int. Cl. C10g *37/00*

U.S. Cl. 208—95 **9 Claims**



Asphaltene - containing hydrocarbonaceous charge stocks are converted via a combination process which involves (1) hydrogenative conversion utilizing unsupported, non-stoichiometric vanadium sulfide catalyst, followed by (2) solids extraction of the product effluent to recover the vanadium sulfide catalyst interspersed among asphaltenes.

3,723,298

HYDROGENATION WITH A Y TYPE ZEOLITE-ARSENIC CATALYST

Walter H. Seltzer, West Chester, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed April 29, 1971, Ser. No. 138,750

Int. Cl. C10g *23/02*

U.S. Cl. 208—143 **3 Claims**

Hydrogenation of a mineral oil containing aromatic hydrocarbons by use of a hydrogenation catalyst comprised of a Y-zeolite containing arsenic.

3,723,299

HYDROGENATION PROCESS

Walter H. Seltzer, West Chester, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Nov. 23, 1971, Ser. No. 201,385

Int. Cl. C10g *23/02*

U.S. Cl. 208—143 **4 Claims**

The process of reducing the nitrogen content of a mineral oil containing aromatic hydrocarbons by hydrogenat-

ing said oil in the presence of a catalyst comprised of a Y-zeolite containing cobalt promoted with manganese or zirconium.

3,723,300

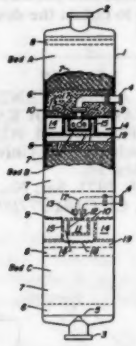
FLUID CONTACTING METHOD FOR FLUID-SOLID CONTACTING

Don B. Carson and William R. Hennemuth, Mount Prospect, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Original application June 23, 1969, Ser. No. 835,449. Divided and this application Mar. 12, 1971, Ser. No. 123,641

Int. Cl. C10g *13/00*

U.S. Cl. 208—146 **11 Claims**



Method for contacting two fluids in a fluid-solids contacting zone, such as an adsorption zone or a reaction zone. A first fluid is passed into a central chamber having a plurality of fluid openings in the chamber wall, while a second fluid is passed into a solids free annular chamber encompassing the central chamber and spaced apart therefrom. The second fluid is discharged via fluid openings in the inner annular chamber wall, into an annular space between the chambers, and the first fluid is discharged from the central chamber into the second fluid discharge. The fluid openings through which the first fluid is introduced into the annular space between the chambers are in substantially axial radial alignment with the fluid openings through which the second fluid is introduced, thereby providing a region of high turbulence for mixing the first and second fluids. A resulting fluid mixture is passed from the annular space into a second central chamber for further mixing and then to a bed of particulated contact solids. Specific application is in hydrogenation, hydrotreating, hydrocracking and hydrodealkylation reactions.

3,723,301

PROCESS FOR THE RECOVERY OF HEAT FROM HYDROCARBONS AND THE SEPARATION THEREOF

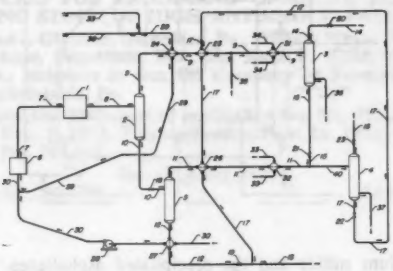
Lynn H. Rice, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 1, 1971, Ser. No. 203,794

Int. Cl. C10g *23/00*

U.S. Cl. 208—213 **14 Claims**

A process flow scheme is disclosed in which a high temperature and high pressure effluent stream is separated into various valuable hydrocarbon fractions. Heat is also recovered from the hydrocarbon effluent. The disclosure contemplates the use of hydrocarbon processes which produce hydrocarbon effluent materials of 400 p.s.i.g. or higher pressure and having at least 500° F. temperatures. The hydrocarbon effluent is flashed in various low pressure flash zones and passed through heat exchangers in order to separate various hydrocarbon components from the effluent while recovering heat from the effluent for improved process efficiencies.



3,723,302

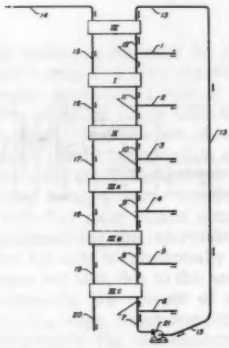
PROCESS FOR SEPARATING OLEFINS FROM SATURATED HYDROCARBONS

Joe M. Pharis and Frank H. Adams, La Grange Park, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 30, 1971, Ser. No. 139,032

Int. Cl. C10g *25/00*

U.S. Cl. 208—310 **10 Claims**



An improved process for separating olefinic hydrocarbons in high purity from a feed stream containing a mixture of olefinic and paraffinic hydrocarbons along with contaminants including aromatic hydrocarbons. The general process operations include a contacting operation wherein an olefinic hydrocarbon is preferentially adsorbed by an adsorbent in an adsorption zone. Subsequent contacting with a desorbent material in a desorption zone effects the removal of preferentially adsorbed olefins from the adsorbent. The improvement resides in effecting the removal of product olefins from the adsorbent by using a second desorbent prior to contacting the adsorbent with a first desorbent to effect a desorption of the more tenaciously held contaminant hydrocarbons. The improvement allows a higher concentration of second desorbent to desorb olefins while preventing contamination of the extract olefins with contaminant materials.

3,723,303
SOLVENT EXTRACTION WITH A SULTONE SOLVENT

Stephen N. Massie, Palatine, and George E. Illingworth, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

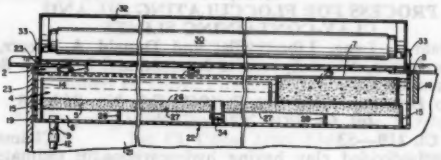
No Drawing. Filed Mar. 22, 1971, Ser. No. 127,027
Int. Cl. C10g *21/16*
U.S. Cl. 208—325 11 Claims

A process for the selective extraction of aromatic hydrocarbons from a feed stock containing both aromatic and saturated hydrocarbons. The process employs a solvent which selectively extracts aromatic hydrocarbons with respect to saturated hydrocarbons from a feed stream. The solvent is removed from a mixture of solvent and feed stock and treated to recover a concentrated stream of aromatic hydrocarbons.

3,723,304
OMNIOLOGICAL FILTER AND PROCESS

Harold A. Storck, P.O. Box 2034, Suva, Fiji

Filed Mar. 24, 1970, Ser. No. 22,350
Int. Cl. E04h *3/16*
U.S. Cl. 210—11 9 Claims

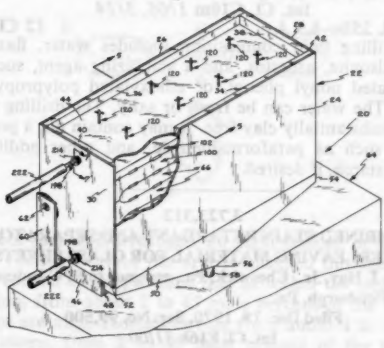


Solid and soluble pollutants are removed from water by means of an apparatus and a process wherein the water is filtered through pads of living marine thread-algae in the presence of light energy entrapping solid pollutants and removing soluble pollutants by photosynthesis.

3,723,305
HEMODIALYSIS

David L. Radford, Salt Lake City, Utah, assignor to Vital Assists, Inc., Salt Lake City, Utah

Filed Jan. 13, 1971, Ser. No. 106,184
Int. Cl. B01d *31/00*
U.S. Cl. 210—22 23 Claims



Hemodialyzing method and apparatus including a plurality of elongated separators having surfaces comprised of densely spaced points. The separators are assembled by generally vertically stacking the separators, the separators being contoured so that a convoluted path exists therebetween. The convoluted path is adapted to removably receive an elongated tubular membrane. Blood is forced through the membrane and dialyzing fluid is forced around the membrane between the spaced points in a direction which crosses the flow of blood. The membrane is replaced by serially removing a separator to expose a portion of the convoluted path, removing the membrane from the exposed portion of the path and removing another separator to support another portion of the path and so on until the membrane can be completely removed. A new membrane is inserted by repeating the mentioned process in reverse order. A novel coupling nipple is disclosed which fits into each end of the tubular membrane, the coupling nipple being attachable at any desired location along the length of the membrane and, once attached, is adjustably mounted in a container for the separators to exert a predetermined tension on the tubular membrane as the membrane traverses the convoluted path.

3,723,306
SEPARATION OF IONS OR MOLECULES FROM MIXTURES USING GRAFT-POLYMERIZED OR POLYMER DEPOSITED ION EXCHANGE OR PERMSELECTIVE MATERIALS

Douglas J. Bridgeford, Champaign, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.

Continuation of Ser. No. 789,064, Jan. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 508,597, Nov. 18, 1965, abandoned, which is a continuation-in-part of Ser. No. 413,997, Nov. 25, 1964, Pat. No. 3,227,510, which is a continuation-in-part of Ser. No. 264,781, March 13, 1963, abandoned, which is a continuation-in-part of Ser. No. 718,995, March 8, 1958, Pat. No. 3,083,118, which is a continuation-in-part of Ser. No. 594,124, June 27, 1956, abandoned, which is a continuation-in-part of Ser. No. 466,218, Nov. 1, 1954, abandoned, which is a continuation-in-part of Ser. No. 445,451, July 23, 1954, abandoned. This application Feb. 19, 1971, Ser. No. 117,155
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—22 13 Claims

Mixtures of materials including solutions, gaseous mixtures, and colloids are purified or separated by contact with or passing through ion exchange or permselective materials which have been modified by polymer deposition or graft polymerization. The materials used in the separatory process are generally webs, membranes, beads, granules, or other shaped objects which have ion exchange capacity or permselective surface characteristics, which materials have been modified by graft polymerization or polymer deposition to provide the desired permselective or ion exchange characteristics.

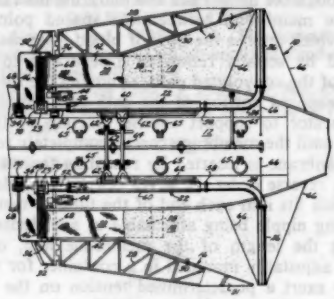
3,723,307
METHOD FOR SEPARATING OIL FROM WATER SURFACE

Raymond E. Hunter, Lomita, Calif., assignor to Ocean Design Engineering Corporation, Long Beach, Calif.

Original application Apr. 8, 1970, Ser. No. 26,666. Divided and this application Mar. 4, 1971, Ser. No. 121,182
Int. Cl. E02b *15/04*
U.S. Cl. 210—33 3 Claims

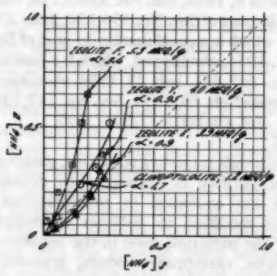
A method for separating oil from a water surface by distributing many small buoyant bodies of flexible foam material upon such surface, continuously lifting such bodies from the surface, compressing the bodies to remove the absorbed oil, and again distributing the bodies upon the surface for re-use. The method preferably utilizes booms for gathering the distributed bodies of foam material toward a conveyor which lifts the bodies upwardly.

The booms are articulated and include floats so that the booms rise and fall with any wave action of the water, such as would exist in the unprotected waters of the open



sea. The methods preferably includes the steps of compressing the oil from the bodies, and thereafter dropping the bodies onto the water surface for re-cycling.

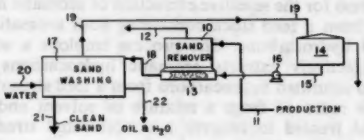
3,723,308
PROCESS FOR REMOVAL OF AMMONIA FROM WASTE WATER STREAMS
Donald W. Breck, 289 Hall Avenue, White Plains, N.Y.
Filed Nov. 16, 1970, Ser. No. 89,782
Int. Cl. C02b *1/44*
U.S. Cl. 210—38 **1 Claim**



Ammonium ions are selectively removed from aqueous solutions containing alkali and/or alkaline earth cations by cation exchange with zeolite F. This is a synthetic crystalline aluminosilicate having a silica-to-alumina oxide mol ratio of about 2 which is derived from a potassium-rich reaction mixture. This zeolite possesses unusual cation exchange capacity and unpredictable selectivity for the ammonium ion.

3,723,309
SYSTEM AND METHOD FOR CLEANING OILY SOLID MATERIAL
Juan A. Garcia, Houston, Tex., assignor to Esso Production Research Company
Filed Sept. 20, 1971, Ser. No. 181,987
Int. Cl. B01d *17/02*
U.S. Cl. 210—44 **23 Claims**

A slurry of solid material, oil and water is pumped from the bottom of a floatation compartment into a cyclone in which the solid material is washed and separated from the oil and water. The lighter, aerated liquid phase separated from the slurry in the cyclone is recirculated to the floatation compartment where the air bubbles in the liquid aid in separating the oil from the water. The separated, heavier solid material is discharged from the cyclone into a rinse compartment. An overflow opening between the rinse and floatation compartments



permits liquid in the rinse compartment to overflow into the floatation compartment. A cleansing agent is preferably added to the slurry fed to the cyclone. Additional washing and separating stages may be added as desired.

3,723,310
PROCESS FOR FLOCCULATING OIL AND CLAY-CONTAINING SLIMES
William J. Lang, Libertyville, and Donald A. Hentz, Barrington, Ill., assignors to International Minerals & Chemical Corporation
No Drawing. Filed Oct. 7, 1969, Ser. No. 864,518
Int. Cl. B01d *21/01*; C02b *1/20*
U.S. Cl. 210—53 **2 Claims**

Finely-divided clay having hydrocarbons in intimate association therewith is flocculated and settled from an aqueous suspension thereof by adding acrylic acid or a water-dispersible anionic acrylic acid-derived polymer, and allowing resulting flocculated solids to settle. Suspended silica may also be flocculated and settled by adding a water-dispersible cationic or nonionic polymer or an inorganic salt as a secondary flocculant.

3,723,311
INERT LOW-SOLIDS DRILLING FLUID
James L. Lummus, Tulsa, and Carl D. Edwards, Broken Arrow, Okla., assignors to Amoco Production Company, Tulsa, Okla.
No Drawing. Continuation-in-part of abandoned application Ser. No. 778,813, Nov. 25, 1968. This application Mar. 17, 1971, Ser. No. 125,374
Claims priority, application Canada, July 4, 1969, 56,163; Great Britain, July 29, 1969, 38,101/69; Netherlands, Aug. 29, 1969, 6913278
Int. Cl. C10m *1/06, 3/14*
U.S. Cl. 252—8.5 A **12 Claims**

A drilling fluid composition includes water, flaxseed gum, gilsonite, asbestos, and a stabilizing agent, such as ethoxylated nonyl phenol, or ethoxylated polypropylene glycol. The water can be fresh or salty. The drilling fluid can be substantially clay-free. It may contain oil, a preservative, such as paraformaldehyde, and other additives, such as starch, if desired.

3,723,312
COMBINED STAIN RETARDANT AND SEPARATOR INTERLEAVING MATERIAL FOR GLASS SHEETS
William J. Hay, Jr., Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 18, 1970, Ser. No. 99,500
Int. Cl. F16k *31/00*
U.S. Cl. 252—11 **4 Claims**

Sheets of glass are packaged, using in place of interleaving paper a dedusted agglomerated salicylic acid or a mixture of dedusted agglomerated salicylic acid and inert separator material, such as polystyrene beads. A novel method for agglomerating the acid is disclosed with the resulting salicylic

acid agglomerated with polyethylene oxide and comprising substantially spherical particles less than about 30 mesh and having only a minor portion less than about 200 mesh. In accelerated staining tests agglomerated salicylic acid protects against staining slightly less than interleaving paper with its high application cost; agglomerated salicylic acid may be applied to sheets of glass with application costs on the order of those for applying wood flour or Lucite, which have extremely limited or negligible stain-retardant qualities, and this agglomerated material prevents surface scratching better than interleaving paper and nearly as well as an inert spherical separator.

3,723,313

LUBRICANT USEFUL IN METAL WORKING

Michael C. Churn, Westcliff, England, assignor to Mobil Oil Corporation

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,763

Int. Cl. C10m *1/10, 1/46*

U.S. Cl. 252—33.3 **12 Claims**

The stability of emulsified lubricant compositions is improved when there is present therein an aromatic oil and a mixture of mono- and dialkyl phosphates, the alkyl having from about 8 to about 20 carbon atoms. The emulsion lubricants containing such materials are useful in the cold rolling of steel.

3,723,314

LUBRICANT FOR METALWORKING

Robert H. Davis, Pitman, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,764

Int. Cl. C10m *1/06, 1/46*

U.S. Cl. 252—33.4 **9 Claims**

An emulsion lubricant for use in cold-rolling of metals containing, on a water-free basis, from about 20% to about 50% of an organic acid, is improved with respect to its hard water stability by having in the lubricant an amount of a mixture of mono- and dioleyl phosphates.

3,723,315

COMPOSITIONS COMPRISING MIXTURES OF SUBSTITUTED TRIARYLPHOSPHATES

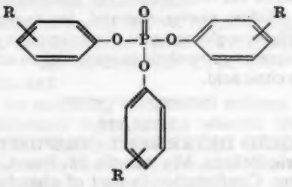
James D. Sullivan, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 110,783, Jan. 28, 1971. This application Mar. 5, 1971, Ser. No. 121,578

Int. Cl. C10m *1/46*

U.S. Cl. 252—49.8 **17 Claims**

Compositions comprising mixtures of phosphate esters having the general structure



wherein each R is hydrogen, an alkyl radical, or an arylalkyl radical wherein the aryl is attached through a tertiary carbon atom, provided that as within the total composition, from about 2 to 45 mole percent of the total R groups are alkyl radicals having from about 4 to 18 carbon atoms, from 2 to 45 mole percent of the total R groups are arylalkyl radicals wherein the alkyl linkage has from about 3 to 13 carbon atoms, and from about 50 to 90 mole percent of the total R groups are hydrogen. The compositions are useful as functional fluids and as components of functional fluid formulations.

3,723,316

STABILIZATION OF ORGANIC SUBSTANCES

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,097

Int. Cl. C10l *1/22;* **C10m** *1/32*

U.S. Cl. 252—50 **4 Claims**

Organic substances normally subject to oxidative deterioration containing, as an inhibitor against said deterioration, a stabilizing concentration of an alpha, beta-unsaturated polynitrile.

3,723,317

LUBRICANT GREASES

Harris Ellsworth Ulery, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 25, 1970, Ser. No. 40,347

Int. Cl. C10m *7/30*

U.S. Cl. 252—51.5 R **16 Claims**

Lubricating greases comprising a fluorinated polyether base oil, from about 4 to about 50% by weight of a polymer of tetrafluoroethylene and from about 0.2% to 15% by weight of a 1,3,5-triazine said triazine having as substituents amino, hydroxy and/or melamino groups.

3,723,318

PROPELLANTS AND REFRIGERANTS BASED ON TRIFLUOROPROPENE

Anthony J. Butler, Greensboro, N.C., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 81,123, Oct. 15, 1970. This application Nov. 26, 1971, Ser. No. 202,656

Int. Cl. C09k *3/06*

U.S. Cl. 252—67 **4 Claims**

Aerosol propellants and refrigerants based on trifluoropropene ($CF_3CH{=}CH_2$) are disclosed.

3,723,319

FUNCTIONAL FLUIDS OF INCREASED FIRE RESISTANCE

Robert S. McCord, Pacific Palisades, Donald H. Nail, Los Angeles, and Martin B. Sheratte, Reseda, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

No Drawing. Filed May 3, 1971, Ser. No. 139,834

Int. Cl. C09k *3/00;* **C10m** *3/40*

U.S. Cl. 252—78 **23 Claims**

Production of functional fluids, particularly aircraft hydraulic fluids, of improved fire resistance, comprising a functional fluid base stock, such as a phosphate ester, e.g., tri-n-butyl phosphate, or mixtures of such base stocks, and a small amount of a trialkyl or a trialkoxy phosphorus selenide compound, e.g., triethyl phosphorus selenide or triethoxy phosphorus selenide.

3,723,320

FUNCTIONAL FLUID COMPOSITIONS CONTAINING EPOXIDE STABILIZERS

John F. Herber, St. Louis, and Robert W. Street and William R. Richard, Jr., Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 210,165, Dec. 20, 1971. This application Mar. 27, 1972, Ser. No. 238,666

Int. Cl. C09k *3/00;* **C10m** *3/40*

U.S. Cl. 252—78 **14 Claims**

Functional fluid compositions comprising a major amount of a base stock material which is an ester or amide of an acid phosphorus, a di- or tricarboxylic acid ester, an ester of a polyhydric compound or mixtures thereof, optionally minor amounts of other base stock materials or base stock modifiers such as viscosity index improvers, cavitation damage inhibitors, and lubricity agents, and an additive amount of an acid scavenger and corrosion inhibitor which is a monoepoxycyclohexyl compound such as C_{1-4} alkyl-3,4-epoxycyclohexane carbox-

ylate. The compositions are particularly useful as aircraft hydraulic fluids.

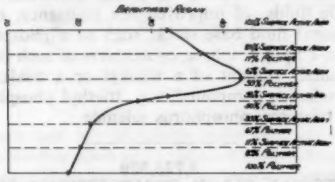
3,723,321
SWEEPING COMPOSITION
David W. Thomas, Ocala, Fla., assignor to NL Industries, Inc., New York, N.Y.
No Drawing. Filed Feb. 16, 1971, Ser. No. 115,833
Int. Cl. C09k 3/22
U.S. Cl. 252—88 11 Claims

A free-flowing particulate sweeping composition consists essentially of a homogeneous calcine of hard absorbent angular ceramic grains. The hard absorbent angular ceramic grains are obtained by mechanically reducing lumps of fired material consisting of a homogeneous mixture of clay and feldspathic material. The firing temperature employed is sufficient to fuse the feldspathic material and to impart hardness to the grains, but is insufficient to fuse the clay. This free-flowing sweeping composition may also contain quantities of sand up to about 60% of the mixture.

3,723,322
DETERGENT COMPOSITIONS CONTAINING CARBOXYLATED POLYSACCHARIDE BUILDERS
Francis L. Diehl, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Feb. 25, 1969, Ser. No. 802,256
Int. Cl. C11d 3/04, 1/12
U.S. Cl. 252—89 1 Claim

Deteregnt and laundering compositions comprising an organic water-soluble synthetic detergent and a water-soluble carboxylated alginic acid builder in a proportion by weight of 10:1 to about 1:20; the carboxylated builder having a degree of substitution of 1.3 to 2.0, an equivalent weight of 97 to 185, a degree of polymerization of 20 to 30,000 and a molecular weight of 4,000 to 5,000,000.

3,723,323
FABRIC TREATING SHAMPOO COMPOSITIONS
Lee W. Morgan, Racine, Wis., and Shrikrishna N. Desai, Bombay, India, assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 22, 1971, Ser. No. 136,434
Int. Cl. C11d 17/00; C08f 15/36
U.S. Cl. 252—90 10 Claims



Fabric treating shampoo compositions comprising a copolymer and at least one surface active agent, the weight ratio of said copolymer to said surface active agent being within the range of about 0.1:1 to about 1:1.

3,723,324
PACKAGE FOR DISPENSING A WARMED COMPOSITION
Victor J. Pierce, 2040 Vestal 90026, and Samuel B. Prussin, 2126 Banyan Drive 90049, both of Los Angeles, Calif.
No Drawing. Continuation of abandoned application Ser. No. 707,993, Feb. 26, 1968. This application May 10, 1971, Ser. No. 142,030
Int. Cl. C11d 17/00
U.S. Cl. 252—90 17 Claims

Packages are described which comprise two compositions maintained isolated from each other within a container, one of the compositions comprising water and the other composition comprising a suspension in an inert anhydrous vehicle of an agent capable of liberating heat upon contact with water. Valve means communicate with each composition, actuation resulting in mixing of portions of each composition and dispensing of the mixture in a warmed state.

3,723,325
DETERGENT COMPOSITIONS CONTAINING PARTICLE DEPOSITION ENHANCING AGENTS
John J. Parran, Jr., Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Original application Sept. 27, 1967, Ser. No. 671,117, now Patent No. 3,580,583. Divided and this application Mar. 11, 1971, Ser. No. 123,456
Int. Cl. C11d 3/48, 1/38
U.S. Cl. 252—106 5 Claims

Detergent compositions containing water-insoluble particulate substances, such as antimicrobial agents, and certain cationic polymers which serve to enhance the deposition and retention of such particulate substances on surfaces washed with the detergent composition.

3,723,326
DETERGENT COMPOSITIONS
Wai Ming Cheng, Ellesmere Port, James Francis Davies, Bromborough, and Leonard Wallace Stuttard, Heswall, England, assignors to Lever Brothers Company, New York, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 808,336, Mar. 18, 1969. This application Sept. 11, 1970, Ser. No. 71,410
Int. Cl. C11d 9/50
U.S. Cl. 252—107 2 Claims

An antibacterial detergent composition, e.g. a toilet bar contains a synergistic mixture of 4,2′,4′-trichloro-2-hydroxydiphenylether, 3,4,4′-trichlorocarbanilide and 4,4′-dichloro-3-trifluoromethylcarbonilide.

3,723,327
GRANULAR PROTEOLYTIC ENZYME COMPOSITION
Daniel Marten van Kampen, Vlaardingen, and Foscarina Pasztor nee Rozzo, Abcoude, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.
Continuation-in-part of Ser. No. 20,019, March 16, 1970, abandoned. This application June 5, 1972, Ser. No. 259,638
Int. Cl. C11d 7/08, 7/42, 17/06
U.S. Cl. 252—110 5 Claims

The invention is directed to an improvement in the storage stability of granular proteolytic enzyme compositions. The proteolytic enzymes are contained in granules to which an acidic substance has been added. The granules will comprise a neutral or alkaline carrier material, for example an alkali metal phosphate; a gluing agent, for example a nonionic surface active agent; a proteolytic enzyme and an acidic material, for example citric acid.

3,723,328
LIQUID DETERGENT COMPOSITION
Carlo Pelizza, Via Aurelia 38, Nervi, Italy
No Drawing. Continuation-in-part of abandoned applications Ser. No. 500,320, Oct. 21, 1965, Ser. No. 595,616, Nov. 21, 1966, Ser. No. 643,414, June 5, 1967, and Ser. No. 774,188, Nov. 11, 1968. This application May 3, 1971, Ser. No. 139,926
Int. Cl. C11d 9/30, 3/066
U.S. Cl. 252—111 5 Claims

Liquid detergent composition consisting essentially of one or more soaps of fatty acids having from 8 to 22 carbon atoms, the cations of said fatty acid soaps being potassium and a cation selected from the class comprising sodium, ethanolamine and mixtures thereof, a solvent comprising water and a hydrotropic substance selected from the class comprising lower saturated monohydric

alcohol having 1 to 4 carbon atoms, potassium paratoluenesulphonate and mixtures thereof, and wetting or fluidifying agent selected from the class comprising glycerol, ethylene glycol and polyethylene glycol with a molecular weight from 200 to 600. The liquid detergent composition contains also sequestering agents, emulsifying agents and defoaming agents, and inorganic and organic salts.

3,723,329

SOAP TABLET PRODUCTION

Elfed Huw Evans, Mold, Wales, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Nov. 2, 1970, Ser. No. 86,373

Claims priority, application Great Britain, Nov. 7, 1969, 54,624/69, 54,625/69

Int. Cl. C11d *9/32*

U.S. Cl. 252—121 **5 Claims**

A process for the manufacture of soap tablets incorporating minor amounts of alkaline earth metal alkyl aryl sulphonates, in which process the tablets are superfatted by the addition to a soap base of a minor amount of free alkyl aryl sulphonic acid, is disclosed. Preferably, the alkaline earth metal alkyl aryl sulphonates are formed in situ in a soap base by the addition to the soap base of an anhydrous alkaline earth metal oxide-sulphonic acid slurry, the tablets being formed subsequently from the soap base.

3,723,330

DETERGENT COMPOSITION

Bob W. Sheflin, Avon, Conn. (% Tri-D Corporation, 7 Johnson Ave., Plainville, Conn. 06062)

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,260

Int. Cl. C11d *3/18*

U.S. Cl. 252—153 **10 Claims**

A new general purpose aqueous alkaline detergent composition particularly effective against unctuous soil consists essentially of a homogeneous dispersion of soap or synthetic detergent, a volatile alkaline detergent builder, water and volatile water-insoluble organic solvents of the halogenated hydrocarbon and dialkyl ether types. The composition preferably is formulated as a concentrated emulsion and at the time of use is diluted with water to obtain a working concentration.

3,723,331

STABILIZATION OF SATURATED HALOGENATED ALIPHATIC HYDROCARBONS

Yves Correia, Saint Auban, France, assignor to Pechiney-Saint-Gobain, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 753,854, Aug. 20, 1968, abandoned. This application March 3, 1971, Ser. No. 120,739

Int. Cl. C09d *9/02*; C11d *7/50*

U.S. Cl. 252—165 **14 Claims**

Method for stabilizing halogenated solvents derived from aliphatic saturated hydrocarbons wherein trioxane is associated with an aliphatic alcohol and/or epoxide liquid at ordinary temperature and this combination is then added to the halogenated solvent.

3,723,332

STABILIZED PERCHLOROFLUOROCARBON COMPOSITIONS

Oliver A. Barton, Florham Park, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 27, 1970, Ser. No. 93,395

Int. Cl. C09d *9/00*; C11d *7/52*; C23g *5/02*

U.S. Cl. 252—171 **11 Claims**

Compositions comprising a perchlorofluorocarbon are stabilized against reaction with lower molecular weight alcohols at elevated temperatures by presence therein of a synergistic stabilizing mixture of a mononitroalkane and an epoxy resin. Said compositions including a lower molecular weight alcohol are useful as solvent media for metal cleaning and dry cleaning of textiles.

3,723,333

METHOD FOR INHIBITING CORROSION AND MINERAL DEPOSITS IN WATER SYSTEMS

Helmut von Freyhold, Dusseldorf-Oberkassel, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

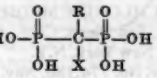
No Drawing. Continuation of abandoned application Ser. No. 821,487, May 2, 1969. This application July 14, 1971, Ser. No. 162,649

Claims priority, application Germany, May 11, 1968, P 17 67 454.3

Int. Cl. C23f *11/18*

U.S. Cl. 252—175 **15 Claims**

Addition to a water system a composition comprising a compound having the following formula



wherein

X is OH or NH_2, and
R is alkyl radical of 1 to 5 carbon atoms;

and a water-soluble, complex-forming compound which contains at least one phosphonate or N-dimethylenephosphonic acid group. Water-soluble salts of the first-mentioned compound can also be used. Relative amounts of the compounds in the composition varies from a molar ratio of from 1:3 to 3:1, respectively. Amount of the composition to be used in water may vary from 1 mg./liter and up to 150% of the quantity of composition necessary for substantially completely converting into complexes the substances imparting hardness to the water.

3,723,334

SCALE REDUCING AGENT IN ZINC PHOSPHATIZING COMPOSITIONS

James Irvin Maurer, St. Clair Shores, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.

No Drawing. Filed Oct. 26, 1971, Ser. No. 192,481

Int. Cl. C02b *1/00, 5/00*

U.S. Cl. 252—181 **9 Claims**

A process for decreasing the scale formation in zinc phosphate composition comprising adding to the phosphatizing composition an effective scale reducing amount of a carbohydrate.

3,723,335

ISOMERIC MIXTURE OF DIBROMOCRESYL GLYCIDYL ETHER

Toru Tanaka, Kenichi Mizoguchi, and Hiroto Nagaoka, Yamaguchi-ken, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed July 23, 1971, Ser. No. 165,729

Claims priority, application Japan, Aug. 7, 1970, 45/68,640

Int. Cl. C07d *1/04*; C08g *51/74*

U.S. Cl. 252—182 **3 Claims**

The present invention relates to an isomeric mixture of dibromocresyl glycidyl ether, composed of 65 to 95% of meta-isomer, 0 to 25% of ortho-isomer and 0 to 25% para-isomer, which, when combined with an epoxy resin composition prior to curing, confers fire-resistance on the cured product.

3,723,336

STABILIZED DIBENZOYL PEROXIDES POLYMER INITIATOR COMPOSITIONS

Jacobus Johannes Antonius Eymans, Deventer, Egbert Willem Holman, Zwolle, and Hans Jaspers, Diepenveen, Netherlands, assignors to Koninklijke Industrieele Maatschappij Noury & Van Der Lande N.V., Deventer, Netherlands

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,611
Claims priority, application Netherlands, Oct. 27, 1969, 6916138
Int. Cl. C01b *15/00*; C08f *1/60*
U.S. Cl. 252—186 6 Claims

A polymer initiator composition and method for its production are provided, the composition being non-separating and stable and including a substantial amount of a dibenzoyl peroxide and an effective amount of a hydrophobic alkyl group-containing silica in an amount sufficient to prevent the composition from physically separating into its components.

3,723,337

HYDROTHERMAL PROCESS FOR GROWING CRYSTALS HAVING THE STRUCTURE OF BERYL IN HIGHLY ACID CHLORIDE MEDIUM

Paul Joseph Yancey, San Diego, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 774,180, Nov. 7, 1968, abandoned. This application Aug. 3, 1970, Ser. No. 67,676
Int. Cl. C09k *1/54*; B01j *17/00*
U.S. Cl. 252—301.4 F 6 Claims

A hydrothermal process for growing relatively large macrocrystals having the structure of beryl. Growth takes place on seed crystals from an aqueous medium which has a chloride ion concentration of at least 4 molar and contains sufficient hydrochloric acid to give a final pH of not greater than 0.1.

3,723,338

METHOD OF REDUCING THE RELEASE OF MOBILE CONTAMINANTS FROM GRANULAR SOLIDS

Wesley L. Godfrey, Pasco, Wash., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed April 28, 1971, Ser. No. 138,371
Int. Cl. C09k *3/00*
U.S. Cl. 252—301.1 W 6 Claims

Granular solids, particularly soil and like solids, containing mobile contaminants, as for example sorbed ionic species, are injected with a hardenable liquid, as for example a thermosetting resin, to fill the interstitial voids and enclose the individual particles. In an important specific embodiment, soil containing radioactive species and particularly soil containing ^{90}Sr and ^{137}Cs is injected with a thermosettable composition comprising a dicarboxylic acid anhydride partial ester mixed with a polymerizable monomer and, preferably, also a polyfunctional material such as polyepoxide, and allowed to polymerize with or without curing agents whereby the composition polymerizes around particles of the soil and immobilizes the radioactive material.

3,723,339

LUMINESCENT PHOSPHOR

Willem Lambertus Wanmaker and Johannus Godefridus Verlijsdonk, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,141
Claims priority, application Netherlands, Apr. 23, 1969, 6906222
Int. Cl. C09k *1/04, 1/68*
U.S. Cl. 252—301.6 R 1 Claim

Luminescent gallate activated by bivalent manganese and having the spinel crystal structure, defined by the formula

$$p(Mg_xLi_{0.5y}Ga_{0.5y}Zn_zO).Ga_{2-a}Al_aO_3.bMnO$$

wherein:

$x+y+z=1$
$0 \leq a \leq 1.0$
$0 \leq x \leq 0.96$
$0 \leq y \leq 0.95$
$0 \leq z \leq 1.00$, wherein $0.05 \leq a \leq 1.0$ if $0.90 < z \leq 1.00$

and wherein

$0.75 \leq p \leq 1.10$
$0.002 \leq b \leq 0.06$

3,723,340

METHOD FOR FOAM GENERATION

Denis Shepherd, South Harrow, Middlesex, England, assignor to Walter Kidde & Company, Belleville, N.J.

Original application Jan. 14, 1969, Ser. No. 791,006. Divided and this application Nov. 1, 1971, Ser. No. 194,236
Claims priority, application Great Britain, Jan. 15, 1968, 2,208/68
Int. Cl. B01j *13/00*
U.S. Cl. 252—307 5 Claims

A method of generating high expansion foam by spraying foaming agents onto a mesh through which gas (usually air) is blown. Pressure sensors on either side of the mesh sense the pressure differential across the mesh and through control means ensure a constant pressure differential despite changes in the back pressure.

3,723,341

ALKALI-HALOGENATED SOLVENT EMULSION SYSTEM

Maurice A. Raymond, Northford, and Michael Scardera, Hamden, Conn., assignors to Olin Corporation

No Drawing. Filed Feb. 12, 1971, Ser. No. 115,115
Int. Cl. B01j *13/00*; C11d *7/06*
U.S. Cl. 252—312 11 Claims

This invention relates to a stable alkali-halogenated solvent emulsion system using selected alkylphenol-glycidol adducts as surfactants.

3,723,342

DEFOAMER COMPOSITION

Hugh J. S. Shane, John E. Schill, and John W. Lilley, Guelph, Ontario, Canada, assignors to Hart Chemical Limited, Guelph, Ontario, Canada

No Drawing. Filed Dec. 21, 1971, Ser. No. 210,544
Int. Cl. B01d *17/00*
U.S. Cl. 252—358 20 Claims

A number of defoamer compositions based on a system containing an aliphatic diamide and a low viscosity mineral oil are described. Some of the compositions additionally contain spreading agents and a silicone oil and some contain a particular diamide. The compositions are useful in the control of foam in pulp mill operations.

3,723,343

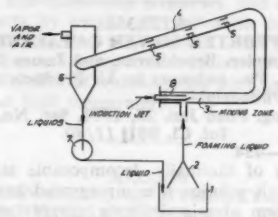
APPARATUS FOR RECONVERTING FOAM TO THE INITIAL LIQUID

Peter Herzhoff, Leverkusen, Hans Gref and Fritz Maus, Cologne, Hans Frenken, Leverkusen-Schlebusch, Josef Friedsam, Langenfeld, and Wolfgang Schweicher, Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 11, 1970, Ser. No. 62,881
Claims priority, application Germany, Sept. 13, 1969, P 19 46 418.7
Int. Cl. B01d *19/00*
U.S. Cl. 252—361 8 Claims

A physical foam-reconverting apparatus in which the foaming liquid is mixed with vapour flowing at high speed and is exposed to such a pressure drop that turbulent flow occurs. With the mixing of the foam with the vapour, first of all some of the vapour condenses, and this then boils out again towards the end of the pressure drop. The liquid which is released in this man-

ner from the foam should as far as possible be under such a pressure that its relevant boiling temperature corresponds to the temperature of the initial liquid from which foam is to be removed.



3,723,344

OXO-SYNTHESIS GAS

Blake Reynolds, Riverside, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,725
Int. Cl. C07c *1/02*
U.S. Cl. 252—373 **8 Claims**

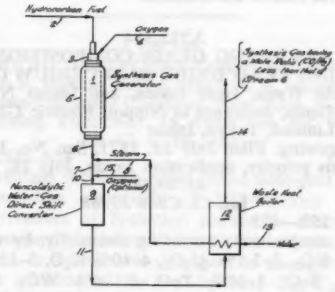
Oxo-synthesis gas, i.e. a mixture of carbon monoxide and hydrogen containing substantially equal volumes of hydrogen and carbon monoxide is produced by direct partial oxidation of a hydrocarbon fuel with oxygen followed by noncatalytic reaction with carbon dioxide at a temperature of at least 1,500°F., and preferably in the range of about 1,700° to 2,800°F. in one or more reaction zones.

3,723,345

SYNTHESIS GAS PROCESS

Blake Reynolds, Riverside, Conn., assignor to Texaco Development Corporation, New York, N.Y.

Filed Nov. 21, 1969, Ser. No. 878,728
Int. Cl. C07c *1/02*
U.S. Cl. 252—373 **9 Claims**



Synthesis gas, i.e., a mixture of carbon monoxide and hydrogen is produced by direct partial oxidation of a hydrocarbon fuel with oxygen followed by non-catalytic reaction with steam at a temperature of at least 1500° F. and preferably in the range of about 1700 to 2800° F. in one or more reaction zones.

3,723,346

TEMPERATURE INDICATOR USING THE SMECTIC C PHASE OF A LIQUID CRYSTAL

Ted R. Taylor, Stow, and James L. Fergason, Kent, Ohio, assignors to International Liquid Xtal Company, Cleveland, Ohio

No Drawing. Filed May 24, 1971, Ser. No. 146,520
Int. Cl. G02f *1/16*
U.S. Cl. 252—408 **10 Claims**

Temperatures may sometimes be quickly and conveniently sensed and/or mapped with the use of a variable-tilt compound of the Smectic C mesomorphic phase. Disclosed are several organic compounds that are capable, within certain temperature ranges, of exhibiting such a phase, such as terephthal-bis(4-n-butylaniline) and other compounds resulting from the reaction of terephthaldehyde with amines or amides of the formula:

where A is $-NH_2$ or $-CONH_2$ and R is a saturated alkyl or alkoxy group containing 1–12 carbon atoms. The compound is made, applied to a surface that has been rubbed unidirectionally, and then (while the compound is within its Smectic C phase temperature range) viewed in light that is polarized planarly or circularly. The temperature indication is sensitive to changes in temperature that are quite small, and the response pattern is exceptionally rapid (being on the order of a millisecond at the greatest), since no molecular rearrangement is involved.

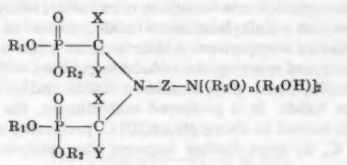
3,723,347

CORROSION INHIBITION COMPOSITIONS CONTAINING SUBSTITUTED DIAMINE PHOSPHONATES AND PROCESSES FOR USING THE SAME

Robert S. Mitchell, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 17, 1972, Ser. No. 254,008
Int. Cl. C23f *11/16*
U.S. Cl. 252—389 A **34 Claims**

Substituted diamine phosphonates of the general formula



wherein R_1, R_2, R_3, R_4, X, Y and Z are hereinafter defined and *n* is 0 – 10, alone or in combination with zinc, dichromates, certain thiols, 1,2,3-triazoles, silicates, inorganic phosphates, molybdates, tannins, lignins, lignin sulfonates, certain calcium and magnesium salts and mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

3,723,348

COORDINATION CATALYST

David Apotheker and Norman M. van Gulick, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 699,361, Jan. 22, 1968, which is a continuation-in-part of application Ser. No. 624,243, Mar. 20, 1967. This application May 15, 1970, Ser. No. 37,937
Int. Cl. C08f *3/02*
U.S. Cl. 252—429 B **17 Claims**

A coordination catalyst system capable of polymerizing alpha-olefins at high efficiency and consisting essentially of a hydrocarbon-soluble vanadium compound, e.g., vanadium oxytrichloride, an organoaluminum halide, e.g., diethylaluminum chloride, a halogen-containing oxidant e.g., benzotrichloride and a hydrocarbon-soluble activator which is more reactive with organoaluminum halides present during polymerization than is said oxidant, e.g., triethylaluminum, the ratios of aluminum atoms, oxidant

moles and activator moles to vanadium atoms being 3–200, 1–2000 and 0.1–150, respectively. The high efficiency of this catalyst system obviates the necessity for removing catalyst residues from a polymer produced by its use.

3,723,349

THERMOCHROMIC COMPOSITION OF COBALT II CHLORIDE IN CURED POLYESTER

Robert William Heseltine, Aughton, and John Burt Dawson, Ormskirk, both of England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Dec. 16, 1970, Ser. No. 98,937
Claims priority, application Great Britain, Dec. 19, 1969, 62,069/69
Int. Cl. G03b 5/22; G01k 11/12
U.S. Cl. 252—408 **9 Claims**

A thermochromic polymer composition is produced by incorporating a methanol solution of cobalt II chloride in an unsaturated polyester resin and then curing the resin without loss of volatiles.

3,723,350

PROCESS FOR THE POLYMERIZATION OF OLEFINS

Karl Schmitt, Herne, and Fritz Gude, Wanne-Eickel, both of Germany, assignors to Scholver-Chemie AG, Gelsenkirchen-Buer, Germany

Continuation-in-part of Ser. No. 646,426, June 14, 1967, abandoned. This application Aug. 17, 1970, Ser. No. 64,667
Claims priority, application Germany, June 16, 1966, 39139
Int. Cl. C08f 1/42
U.S. Cl. 252—429 C **6 Claims**

Improved olefin polymerization catalyst made by mixing a titanium tetra halide, a zirconium tetra halide, a titanium tetra ester, a chromium oxyhalide or a mixture thereof with a vanadium oxyhalide or a vanadium tetra halide; reducing such admixture with a dialkylaluminum halide, wherein at least one of the mixture components and/or reductant has a fluorine substituent; and reacting the reduction product with an aluminum trialkyl, and alkyl aluminum halide and/or a dialkyl aluminum halide. In a preferred embodiment, the reaction product is heated to above about 20° C, preferably about 20° to 200° C, to even further improve the catalytic activity thereof.

3,723,351

CATALYST FOR ELEVATED TEMPERATURES

William H. Flank, Broomall, James E. McEvoy, Springfield, and John R. Stuart, deceased, by Clara M. Stuart, successor, Brookhaven, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 693,733, Dec. 27, 1967. This application Jan. 25, 1971, Ser. No. 109,639
Int. Cl. B01j 11/40
U.S. Cl. 252—454 **10 Claims**

Catalyst carrier particles having a low surface area open pore structure, and low density and consisting of calcium sodium alumino disilicate foam and having a non-zeolitic crystalline structure are prepared by heating precursor pellets at about 900–1150° C. for several minutes. A zeolitic sodium alumino disilicate of a type called Zeolite A is prepared by refluxing meta kaolin in 10% sodium hydroxide solution or by any other Zeolite A synthesis. Such sodium zeolite is at least 50% ion-exchanged to the calcium form to provide said precursor pellets. The ceramic foam particles are impregnated with a liquid containing a metal component. Thereafter the impregnated particle is heated to bond the catalytic metal to the foamed ceramic particle. Such particles comprising catalytic metal components on ceramic foam are catalysts for reactions conducted at elevated temperatures, comprising hydrolysis of hydrocarbonaceous material, oxidation reactions, and hydrogenative aromatization of hydrocarbonaceous materials.

3,723,352

SUPPORTED SILVER CATALYSTS

Warner Alexander, Brookhaven, and James E. McEvoy, Springfield, Pa., assignors to Air Products and Chemicals, Inc., Philadelphia, Pa.

No Drawing. Filed Jan. 25, 1971, Ser. No. 109,640
Int. Cl. B01j 11/40
U.S. Cl. 252—454 **3 Claims**

A solution of thermally decomposable salt of silver and a gold salt solution are impregnated into a foamed calcium sodium aluminodisilicate support and calcined to provide a supported silver catalyst containing a trace amount of gold, said catalyst having effectiveness in the synthesis of ethylene oxide.

3,723,353

COPPER CATALYST

Jacobus J. M. G. Eurlings, Valkenburg, John W. Geus, Geleen, and Cornelis A. M. Weterings, Stein, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed May 25, 1970, Ser. No. 40,330
Int. Cl. B01j 11/42
U.S. Cl. 252—459 **4 Claims**

The present invention relates to a process for the preparation of a catalyst mass from dilute aqueous solutions of copper and nickel salts, particularly precipitation of a copper compound out of an aqueous solution onto a thermally stable carrier material suspended therein. The copper compound is secured to the carrier material via a nickel compound and is reduced to metallic copper after being so secured. Copper catalysts have a wide field of application in dehydrogenation reactions, e.g. the dehydrogenation of cyclohexanol to cyclohexanone and of isopropyl alcohol to acetone. Copper catalysts are also very suitable for carrying out selective hydrogenation processes, There are indications that metallic copper surfaces may greatly accelerate the oxidation of hydrocarbons e.g. cumene via radical mechanisms.

3,723,354

X-RAY ABSORBING GLASS COMPOSITIONS CONTAINING LEAD OXIDE AND CERIUM OXIDE

Masamichi Wada, Iwao Ishida, and Isamu Nakagawa, Otsu, Japan, assignors to Nippon Electric Glass Company, Limited, Tokyo, Japan

No Drawing. Filed July 21, 1971, Ser. No. 164,855
Claims priority, application Japan, July 28, 1970, 45/45,396
Int. Cl. C04b 35/68
U.S. Cl. 252—478 **8 Claims**

Glass compositions consisting essentially, by weight, of 57–62% SiO_2, 2–3.5% Al_2O_3, 4–10% K_2O, 5–11% Na_2O, 10–16% BaO, 1–10% ZnO, 0.1–4% WO_3, 0.2–0.6% CeO_2, less than 5% CaO, less than 2% MgO and less than 1% PbO, wherein the total of the amounts of CaO, MgO and BaO exceeds 14% and the total of the amounts of BaO, ZnO, WO_3, and PbO exceeds 12%.

3,723,355

ELASTOMERIC MIXTURES VULCANIZABLE TO ELECTRICALLY CONDUCTIVE VULCANISATES AND METHODS OF PREPARING THE SAME

Johannes Jacobus and Cornelis Schats, Bussum, and Hendrik Schenk, Santpoort, Netherlands, assignors to Koninklijke Zwavelzuurfabrieken Voorheen Ketjen N.V., Amsterdam, Netherlands

No Drawing. Filed Sept. 30, 1970, Ser. No. 76,984
Claims priority, application Netherlands, Oct. 3, 1969, 6914953
Int. Cl. H01b 1/06; C01b 31/00; C08h 17/08
U.S. Cl. 252—511 **20 Claims**

Electrically conductive vulcanisates having desirable mechanical properties are obtained by vulcanization of

elastomeric mixtures containing for each 100 parts, by weight, of elastomer, approximately 40 to 400 parts, by weight, of non-conductive filler which may have reinforcing or non-reinforcing properties, and approximately 2 to 15 parts, by weight, of gasification carbon, that is, the carbon obtained as a by-product in the preparation of a gas mixture containing carbon monoxide and hydrogen by the gasification of hydrocarbons with oxygen-containing gases at high temperature.

3,723,356

COMBINATIONS OF HYDROXYALKYL-N-METHYLTAURINES AND ANIONIC SURFACTANTS AS SYNERGISTIC EMULSIFIERS

Arno Cahn, Pearl River, N.Y., Joseph Anthony Ackilli, Dover, Del., and Frank Emery Carroll, Wyckoff, N.J., assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 828,002, May 26, 1969, now Patent No. 3,649,543, which is a continuation-in-part of abandoned application Ser. No. 573,192, Aug. 18, 1966. This application Oct. 28, 1971, Ser. No. 193,570

Int. Cl. C11d *1/28, 1/37, 1/84*

U.S. Cl. 252—526 **5 Claims**

Emulsifying agents characterized by unusual mildness toward the skin are disclosed which consist essentially of a synergistic combination of a water soluble taurine salt of the general formula:

$$R_1—CH(OH)—CH_2—N(CH_3)—CH_2—CH_2—SO_3M$$

wherein R_1 is an alkyl radical having from 12 to 18 carbon atoms or an oxaalkyl radical having the formula, $C_nH_{2n+1}—O—CH_2$, n being 11 to 17, and M is a water-solubilizing cation and a surface active organic sulfate or sulfonate detergent which may be an amidomethanesulfonate, an acyl isethionate, or an N-(acyloxyethyl) sulfoacetamide. The taurine salt and the detergent are present in a specified weight ratio to obtain maximum synergism.

3,723,357

LIQUID DETERGENT COMPOSITION

Kenneth R. Hansen, Staten Island, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,152

Int. Cl. C11d *1/84*

U.S. Cl. 252—545 **5 Claims**

The invention relates to novel liquid detergent compositions consisting essentially of N(2-hydroxy C_{10}–C_{18} alkyl) derivatives of N-methyl taurine or sarcosine or diethanolamine in combination with on anionic sulfate, zwitterionic, or amphoteric detergent in an aqueous medium. The addition of the N(2-hydroxy C_{10}–C_{18} alkyl) derivatives results in substantially increased foam-drainage times and better foaming properties.

3,723,358

FABRIC TREATING SHAMPOO COMPOSITIONS

Lee W. Morgan and John R. Rogers, Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

No Drawing. Filed Feb. 22, 1971, Ser. No. 117,728

Int. Cl. C11d *1/10, 1/12, 3/20*

U.S. Cl. 252—546 **11 Claims**

Fabric treating shampoo composition comprising an aqueous solution of at least one anionic or nonionic surfactant, and a copolymer of about 50 to 60% styrene and 33 to 43% acrylic or methacrylic acid and up to about 13% of a viscosity modifying monomer such as isobutyl acrylate, said copolymer having a molecular weight from about 5,000 to about 50,000 and being water soluble at alkaline pH values.

3,723,359

CERMET POWDERS

Richard J. Borg; David Y. F. Lai; Neil R. Riley, and James R. Wolfe, all of Livermore, Calif., assignors to California Metallurgical Industries, Inc., Livermore, Calif.

Filed June 8, 1970, Ser. No. 44,608

Int. Cl. H01b *1/02;* **B22f** *3/00*

U.S. Cl. 252—513 **6 Claims**

A metallurgical method for making homogeneous powders characterized by ultra-fine particle size typically in the range .01 – .1 microns. First, dry blend starting materials containing a mixture of carbon and the metal oxides of two or more different metals, one metal having a predetermined carbide forming strength and the other metal having less than the predetermined carbide forming strength. The starting materials are then cold mixed with a liquid pre-polymerized furfuryl alcohol resin binder containing a catalyst until a homogeneous mass is obtained. The mass is cold extruded into the shape of an electrode, cured to the desired hardness and then rapidly baked until electrically conductive. The electrode is then connected as the anode in a high intensity electric arc circuit enclosed in a non-oxidizing atmosphere. The arc process consumes the anode and a homogeneous powder is produced out of the characteristic tail flame. The powder comprises a mixture of finely divided particles of metal carbide and metal useful in manufacturing cemented carbide bodies.

3,723,360

SHAMPOO OF IMPROVED FOAMING AND LATHERING POWER COMPRISING HIGHER FATTY ALCOHOL SULFATE AND SUBSTITUTED IMIDAZOLINE

Gordon Trent Hewitt, Upper Montclair, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Mar. 24, 1971, Ser. No. 127,842

Int. Cl. C11d

U.S. Cl. 252—542 **8 Claims**

An aqueous shampoo composition of improved foaming and lathering power includes a major proportion of aqueous solvent medium and minor proportions of higher fatty alcohol sulfate and of a 1-hydroxy-lower alkyl, 2-higher alkyl imidazoline, at a slightly basic pH.

ERRATUM

For Class 260—45.75 R see:
Patent No. 3,723,139

3,723,361

CYANO-SUBSTITUTED POLYEPOXIDES

Herbert A. Newey, Lafayette, and Howard V. Holler, Oakland, Calif., assignors to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 24, 1970, Ser. No. 75,253

Int. Cl. C08g *30/02, 30/04, 30/08*

U.S. Cl. 260—2 EP **14 Claims**

Novel cyano- and epoxide-containing resins having at least two epoxide groups and at least one cyano group per molecule are described. These novel resin may be cured with epoxy curing agents to produce hard, flexible, insoluble compositions which are especially siutable as molding compounds, coatings and adhesives.

3,723,362

LOW DENSITY POLYSTYRENE PEARLS AND METHODS OF MAKING THEM

Jean Battigelli, Rantigny, Oise, France, assignor to Saint-Gobain, Neuilly-sur-Seine, France

Filed Oct. 21, 1968, Ser. No. 769,043

Claims priority, application France, Nov. 14, 1964, 128,060

Int. Cl. C08f *33/02, 47/10*

U.S. Cl. 260—2.5 B **11 Claims**

Polystyrene pearls are made by insufflating polystyrene particles containing expansion agent by hot air followed by brief insufflation by superheated steam. A further advantage can be obtained by subjecting these expanded

pearls to heat treatment in an autoclave. The successive treatments by hot air and steam are at atmospheric pressure and at temperatures which are adequate to soften the polystyrene and activate the expansion agent. Products can be produced which have any chosen density from 2.5 kg./m.^{3} upward. Products of lowest densities are unique.

3,723,363

TRIMERIZED CRUDE ISOCYANATE MIXTURES AND POLYURETHANE FOAMS PREPARED FROM SAME

Fred D. Shaw, Jr., 6911 W. 69th St., Overland Park, Kans.

Continuation-in-part of Ser. No. 676,626, Oct. 19, 1967, abandoned. This application Sept. 23, 1970, Ser. No. 74,872

Int. Cl. C08g *22/44, 22/22*

U.S. Cl. 260—2.5 AW **22 Claims**

Polyisocyanate compositions containing phosgenation by-products and isocyanurate radicals. The polyisocyanates are used in the preparation of various polyurethane products such as foams, coatings, adhesives and solid elastomers. The polyisocyanates are particularly valuable in the preparation of low density, rigid foams having high insulation value, high compressive strength and good dimensional stability at low and high temperatures.

3,723,364

COPOLYMER FOAMS CONTAINING ISOCYANURATE, CARBODIIMIDE AND EITHER AMIDE OR IMIDE LINKAGES

Alexander McLaughlin, Meriden, Herbert G. Nadeau, North Haven, and James S. Rose, Guilford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,896

Int. Cl. C08g *20/20, 20/32, 20/38*

U.S. Cl. 260—2.5 AC **11 Claims**

The friability of polymer foams in which the major recurring units are a combination of isocyanurate and either amide or imide or both, is markedly reduced by introducing a minor proporation of carbodiimide linkages into the polymer. This is accomplished by incorporating a carbodiimide-forming catalyst (e.g. a phospholene oxide) into the polymer foam forming reaction mixtures employed to prepare the above type of foam. The resulting foams are highly useful, heat resistant, thermally insulating materials.

3,723,365

ONE SHOT RIGID FOAMS FROM SUCROSE POLYOLS

George Phillip Speranza and Philip Hotchkiss Moss, Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 849,182, Aug. 11, 1969. This application Apr. 2, 1971, Ser. No. 130,792

Int. Cl. C08g *22/44*

U.S. Cl. 260—2.5 AS **5 Claims**

This invention is a new class of rigid polyurethane foams and a process for making these foams using a polyarylisocyanate and unique sucrose based polyols. The polyols are made by modifying conventional sucrose polyols. Conventional sucrose polyols are made by reacting sucrose with alkylene oxides containing 2 to 4 carbon atoms or mixtures thereof. These conventional sucrose polyols are reacted with higher molecular weight alkylene oxides to make the polyols of this invention. The resultant polyols enable rigid polyurethane foams to be made in one step (one shot) from polyarylisocyanates. Sucrose based rigid urethane foams are useful in many areas including insulation, decorative and structural paneling, flotation, and many other applications. Rigid urethane foams made from sucrose based polyols are especially desirable since they can easily be fire-retarded.

3,723,366

CARBODIIMIDE FOAMS AND IMPROVED PROCESS FOR PREPARING SAME

Peter T. Kan, Wyandotte, Plymouth, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 28,555, April 13, 1970, abandoned. This application June 25, 1971, Ser. No. 157,025The portion of the term of this patent subsequent to Feb. 28, 1989, has been disclaimed.

Int. Cl. C08g *22/44, 22/36*

U.S. Cl. 260—2.5 BF **8 Claims**

Rigid foam compositions characterized by carbodiimide linkages are prepared from the catalytic condensation of an organic polyisocyanate in the presence of a co-catalyst system consisting essentially of a mixture of 2,4,6-tris (dialkanolamino)-s-triazine and 1,3,5-tris(N,N-dialkylaminoalkyl)-s-hexahydrotriazine.

3,723,367

ALKALI METAL MERCAPTIDES AS URETHANE-ISOCYANURATE CATALYSTS

Sui-Wu Chow, Somerville, and Markus Matzner, Edison, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Mar. 27, 1972, Ser. No. 238,588

Int. Cl. C08g *22/40, 22/44*

U.S. Cl. 260—2.5 AB **13 Claims**

Alkali metal mercaptides have been found useful as catalysts in the reaction of organic isocyanates with compounds having a reactive hydrogen atom. The catalysts are particularly effective in the production of urethane and isocyanurate compounds.

3,723,368

FAST BAKING CORE COMPOSITION AND PROCESS FOR PREPARATION THEREOF

Lloyd H. Brown, Crystal Lake, Daniel S. P. Eftax, Barrington, George S. Everett, Clarendon Hills, and James R. Oldham, Wheeling, Ill., assignors to The Quaker Oats Company, Chicago, Ill.

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,245

Int. Cl. C08g *51/18*

U.S. Cl. 260—17.2 **4 Claims**

This invention relates to fast baking core compositions which have long bench life, high tensile strength on cure, good resistance to humidity on cure and high green strength, yet the core composition is blowable. The fast baking core compositions of this invention comprise a thermosetting resin selected from the group of furan, phenolic resole, and furan-phenolic resins; a gelling agent; water; hydrophobic resin; and sand; said hydrophobic resin being a member selected from the group consisting of solid powdered phenolic novolacs and solid rosins.

3,723,369

VINYL HALIDE RESINS PLASTICIZED WITH AN ACYLATED POLYESTER OF A DIBASIC ACID AND A MIXTURE OF GLYCOLS

John T. Lutz, Jr., Cornwells Heights, and Constance A. Lane, Philadelphia, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed Dec. 1, 1971, Ser. No. 205,710

Int. Cl. C08f *21/04;* **C08g** *17/16*

U.S. Cl. 260—22 CB **3 Claims**

Compositions of improved low temperature service properties comprise a vinyl halide resin and a polyester of the formula

$$AcG(AG)_nAc$$

wherein Ac represents a monobasic acyl radical containing 2 to 18 carbon atoms, G is the residue of a mixture of 1,2-propylene glycol, 1,4-butylene glycol and dipropylene glycol, A is the residue of a dibasic acid which is at least one saturated aliphatic dibasic acid having an alkylene chain of 4 to 10 carbons and n is such that the resulting polyester is characterized by a number average molecular weight in the range of 1500 to 4000 as determined by vapor phase osmometry in benzene solution.

3,723,370

URETHANATED UNSATURATED POLYESTER RESIN AND PROCESS FOR PRODUCING THE SAME

Tadashi Watanabe; Kouichiro Murata; Kiyoshi Nanishi, and Akira Yamamoto, all of Kiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki-shi, Hyogo-ken, Japan

Filed March 17, 1971, Ser. No. 125,391
Int. Cl. C08g *22/10;* C09d *3/72*
U.S. Cl. 260—22 TN 8 Claims

An oil modified unsaturated polyester resin in which at least one hydroxyl group is left at a terminal of its molecule, having a number average molecular weight of from about 1,000 to about 4,000 and acid value of from 5 to 60 is made to react with at least one diisocyanate compound having from 0.2 to 1.2 equivalent of isocyanato group with respect to 1 equivalent of hydroxyl group of said unsaturated polyester resin to produce an urethanated unsaturated polyester resin having a molecular weight of from about 2,000 to about 20,000.

3,723,371

HOT MELT ADHESIVE HAVING IMPROVED CREEP PROPERTIES

Robert H. Campbell, Brookhaven, and Wesley R. Cherry, Prospect Park, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

No Drawing. Continuation of abandoned application Ser. No. 539,298, Apr. 1, 1966. This application Dec. 10, 1970, Ser. No. 97,051
Int. Cl. C08f *45/52;* C08g *51/52*
U.S. Cl. 260—28.5 AN 12 Claims

The creep properties of a hot melt adhesive containing 35 to 65 parts by weight of an ethylene-vinyl acetate copolymer which contains 17 to 30 weight percent vinyl acetate and 30 to 45 parts by weight of an aromatic hydrocarbon-aldehyde resin having a ring and ball softening point in the range of 70 to 150° C. can be improved by adding to this composition 10 to 25 parts by weight of a crystalline wax having a melting point of at least 150° F.

3,723,372

BLOCKED POLYURETHANES SOLUBLE OR COMPATIBLE IN WATER ORGANIC SOLVENTS AND POLYOLS

Saburo Wakimoto, Hyogo, Hideyosi Tugukuni, Osaka, Masafumi Kano, Kyoto, Yutaka Matsui, Hyogo, and Jugo Goto, Osaka, Japan; said Matsui and said Goto assignors to Takeda Chemical Industries, Ltd., and said Wakimto, Tugukuni and said Kano assignors to Dai Nippon Toryo Co., Ltd., both of Osaka, Japan

No Drawing. Filed Apr. 29, 1970, Ser. No. 33,081
Claims priority, application Japan, Apr. 30, 1969, 44/33,878
Int. Cl. C08g *51/24, 51/26, 22/32*
U.S. Cl. 260—29.1 R 6 Claims

Novel partially blocked isocyanate polymers suitable for the preparation of three dimensional coating films are prepared. The coating films are prepared by heating the blocked isocyanates in the presence of an active hydrogen containing compound.

3,723,373

0.1% TO ABOUT 2.0% BY WEIGHT POLYTETRAFLUOROETHYLENE EMULSION MODIFIED POLYETHYLENE TEREPHTHALATE WITH IMPROVED PROCESSING CHARACTERISTICS

Howard Robert Lucas, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Oct. 4, 1971, Ser. No. 186,495
Int. Cl. C08f *45/24;* C08g *39/10*
U.S. Cl. 260—29.6 F 1 Claim

Compositions of matter comprising polyethylene terephthalate having incorporated therein small amounts of polytetrafluoroethylene wherein the resultant composition may be extruded, blow molded, film blown etc., are disclosed.

3,723,374

THERMOSET ORGANIC COMPOSITIONS CONTAINING TRISULFONYLMETHANES

Girish Girdhar Parekh and Werner Josef Blank, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 1, 1971, Ser. No. 130,526
Int. Cl. C08g *51/24*
U.S. Cl. 260—29.4 UA 6 Claims

A coating composition comprising (1) from about 40% to about 95%, by weight, of an anionic acrylic polymer containing at least a carboxyl or alcoholic hydroxyl function, (2) from about 4.9% to about 50%, by weight, of an amine-aldehyde cross-linking agent and (3) from about 0.1% to 10%, by weight, of an acyclic trisulfone is provided. The composition finds utility in coating applications wherein low temperature cure of the said coated resinous compositions can be obtained with attendant high resistance to organic solvents.

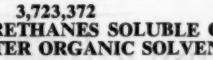
3,723,375

NOVEL ANHYDRIDE INTERPOLYMERS

Nathan D. Field, Allentown, and Earl P. Williams, Pen Argyl, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 625,585, Mar. 24, 1967. This application Nov. 24, 1970, Ser. No. 92,510
Int. Cl. C08f *15/40, 27/08*
U.S. Cl. 260—29.6 TA 10 Claims

Anhydride interpolymers and their water-soluble derivatives comprising maleic anhydride and vinyl monomers of two different classes, one class being styrene, the other class being represented by the structural formula



wherein R_1 is an organic radical containing C_6 to C_{36} carbon atoms, Y is hydrogen, halogen, alkyl or phenyl and X is oxygen, sulphur, carboxy, carbonamido or a chemical bond; said anhydride interpolymers being very useful as thickening agents for solutions of high ionic strength.

3,723,376

AEROSOL TEXTILE SIZING PRODUCT AND METHOD

Roger C. Steinhauer, 291 Dogwood, Park Forest, Ill. 60466; Leonard A. Falevitch, 5932 Peck Ave., La Grange, Ill. 60525; and David R. Church, 188 Dogwood, Park Forest, Ill. 60466

Filed Oct. 5, 1970, Ser. No. 77,968
Int. Cl. C08f *33/04, 33/08*
U.S. Cl. 260—29.6 HN 12 Claims

Aerosol aqueous sizing products characterized in providing highly variable amounts of stiffness are provided, comprising polyvinylpyrrolidone having an average molecular weight of about 10,000 to 400,000 along with a water-soluble siloxane-oxyalkylene block copolymer.

3,723,377

PROCESS OF REDUCING FORMALDEHYDE ODOR OF AQUEOUS MIXTURES CONTAINING METHYLOLATED CARBAMATES

Myrtle Joanne Spangler, Danville, Va., assignor to Dan River Inc., Danville, Va.

No Drawing. Filed Dec. 18, 1968, Ser. No. 784,935
Int. Cl. D06m *15/58, 15/54;* C08g *32/28*
U.S. Cl. 260—29.4 R 9 Claims

Process for reducing formaldehyde odor of aqueous mixtures containing methylolated carbamates comprising the steps of mixing such aqueous mixtures with 4,5-dihydroxy-2-imidazolidinone and/or its methylolated and/or alkylated derivatives. The process results in aqueous mixtures containing methylolated carbamates and methylolated 4,5-dihydroxy-2-imidazolidinone, as such or in alkylated form, having a free formaldehyde content of not more than about 1.0 weight percent.

3,723,378

METHOD FOR PREPARING PLASTICIZED GRANULAR POLYMERS CONTAINING ACRYLONITRILE AS THE MAIN COMPONENT

Masatoshi Yoshida, and Minoru Hirai, both of Suntou-gun, Japan, assignors to Toho Beslon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1971, Ser. No. 174,330

Claims priority, application Japan, March 3, 1971, 46/11165

Int. Cl. C08f *45/28, 45/46*

U.S. Cl. 260—30.8 DS 8 Claims

A method for preparing plasticized granular acrylic polymer is provided. The method comprises polymerizing acrylonitrile or a monomer mixture containing a majority of acrylonitrile with stirring in dispersed state in a ternary system liquid medium comprising at least one non-solvent compound, an organic solvent for acrylic polymers but having no solubility with respect to said compound, and water. The non-solvent compound is a saturated hydrocarbon having five to 10 carbon atoms. The resulting granular polymer each grain of which has approximately 0.1 mm. to 4 mm. diameter is preferably dried in vacuo at a temperature below 60°C after separation from the dispersion polymerization reactant system. If necessary, it may be subjected further to heat treatment at a temperature below 100°C in a sealed vessel. The resulting granular polymer is not necessarily to be subjected to plasticization which is completed by means of said organic solvent and can be subjected directly to semi-melt spinning with the use of an extruder.

3,723,379

VINYL DISPERSION TEXTURED COATING

Harlan E. Althouse, Pontiac, and Fremont L. Scott, Birmingham, Mich., and Gordon E. Cole, Jr., Greenwich, Conn., assignors to M & T Chemicals Inc., New York, N.Y.

No Drawing. Filed June 8, 1970, Ser. No. 44,625

Int. Cl. C08f *45/40*

U.S. Cl. 260—31.8 M 4 Claims

In accordance with certain of its aspects, this invention relates to novel compositions and to a process for preparing an article having a textured coating which comprises bonding to a substrate a self-adhering coating composition containing:

(a) 16.0–34.2 parts by weight of a first vinyl resin having a relative viscosity of 1.98–2.35; a molecular weight of about 75,000–101,000, and an average particle size of about 0.5–7.0 microns;

(b) 3.8–24.0 parts by weight of a second halogen-containing resin having a specific viscosity of about 0.50, an inherent viscosity of about 1.20, a molecular weight average of about 127,000, and a particle size range of at least 7.0 microns to 177 microns;

(c) 1.0–7.6 parts by weight of a third vinyl solution resin with reactive sites having a vinyl chloride content of 75.0 to 91.5 percent copolymerized with at least one member selected from the group consisting of vinyl acetate, vinylidene chloride, or an ester of maleic acid, and having an inherent viscosity of about 0.34–0.46;

(d) 0.2–3.8 parts by weight of a liquid epoxy resin having a viscosity of about 10,000–20,000 centipoises and an epoxy equivalent weight of about 180–220;

(e) 1.2–14.7 parts by weight of an amine resin;

(f) 17–30.4 parts by weight of a plasticizer;

(g) About 0.0–15.3 parts by weight of a solvent-diluent which when present cooperates with plasticizers to dissolve the third vinyl resins (c), the liquid epoxy resin (d), and the amine resin (e) but does not gel or dissolve either the first vinyl resin (a), or the second halogen-containing resin (b) at temperatures of about 20–35° C.;

And wherein the first vinyl resin (a) and the second resin (b) are incompletely soluble in plasticizer (f) at temperatures of 20–35° C. and wherein plasticizer (f) is capable of completely solubilizing the third vinyl resin solution (c);

(h) 3.0–23.7 parts by weight of pigments and/or fillers; and, optionally,

(i) 1.6–2.5 parts by weight of at least one polyvinyl chloride stabilizer,

Wherein the total parts by weight of ingredients (a)–(i) amounts to 100 parts.

3,723,380

AROMATIC AMIDE-HYDRAZIDE COPOLYMER

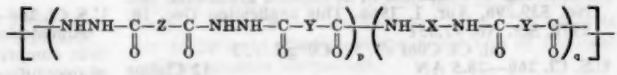
Frank Dobinson, Gulf Breeze, Fla., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of abandoned application Ser. No. 29,259, Apr. 16, 1970. This application Feb. 4, 1972, Ser. No. 223,699

Int. Cl. C08g *20/00, 51/44*

U.S. Cl. 260—32.6 NT 30 Claims

Aromatic amide-hydrazide copolymers are provided. These copolymers are characterized as being fiber-forming and having recurring structural units of



X and Y are divalent aromatic radicals; and Z is a divalent aromatic radical or a chemical bond. *p* and *q* are integers. The aromatic radicals have a molecular weight of less than 250 and are comprised of one or two meta- or para-phenylene linkages. The ratio of *p*:*q* is in the range of from 1:3 through 9:1. Solutions of these polymers in amide solvents are suitable for use in spinning filaments, even though greater than 65% of the arylene moieties are para-phenylene.

3,723,381

POLY(VINYL ACETATE-DIALKYL MALEATE ACRYLIC ACID) TEXTILE SIZES

Albert E. Corey, East Longmeadow, Donald D. Donermeyer and Joel Fantl, Springfield, and Charles R. Williams, Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 16, 1970, Ser. No. 98,915

Int. Cl. C08f *45/30*

U.S. Cl. 260—33.8 UA 6 Claims

Disclosed herein are poly(vinyl acetate-dialkyl maleate-acrylic acid) textile sizes and textiles sized therewith.

3,723,382

FRICTION MATERIALS

John B. Lumb, Bradford, and Michael Edwards, Leeds, both of England, assignors to BBA Group Limited, Cleckheaton, Yorkshire, England

Filed April 13, 1971, Ser. No. 133,765

Claims priority, application Great Britain, April 15, 1970, 17,965/70; Sept. 30, 1970, 46,434/70

Int. Cl. C08g *51/04, 51/10*

U.S. Cl. 260—38 8 Claims

A friction material for friction braking or transmission systems including in its finished state a two-part binder system, one part being a phenolic thermosetting resin and the other part being uncombined nickel and sulphur. The nickel and sulphur are capable of reacting together under the action of heat generated during application of the system to form nickel sulphide which provides additional binding in the material and compensates for thermal decomposition of the resin. Friction modifiers and fillers may also be included.

3,723,383

NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed July 26, 1971, Ser. No. 166,242
Int. Cl. C08f *45/04, 45/58*
U.S. Cl. 260—41 B 3 Claims

Novel flame retardant compositions of matter comprise a thermoplastic compound, a polychloro-substituted organic compound, a polybromo-substituted organic compound and, if so desired, an antimony-containing compound or a tin-containing compound. The polyhalo-substituted organic compounds are characterized by possessing a low volatility, a high molecular weight, and a high halogen content. These compositions of matter are exemplified by a mixture of polypropylene, 5,6,7,8,9,9-hexachloro - 1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalene dicarboxylic anhydride, hexabromocyclododecane and antimony trioxide.

3,723,384

REDUCTION OF OXIDATIVE DEGRADATION AND THE CATALYSIS OF PEROXIDE DECOMPOSITION

Christopher Copping, Waltham Abbey, and Norbert Uri, London, both of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Norther Ireland, London, England

Filed Aug. 12, 1969, Ser. No. 849,399
Int. Cl. C08f *45/62*; C08g *51/62*
U.S. Cl. 260—45.75 N 9 Claims

Oxidative degradation of many organic materials, particularly polymers such as polyolefins, may be greatly reduced by the incorporation therein of certain transition metal complexes of α-dithiodiketones. These complexes can offer protection against oxidative degradation induced by many different factors including exposure of the organic materials to heat, light, ultra violet ray and gamma ray irradiation.

3,723,385

SILOXANE CONTAINING PREPOLYMERS AND POLYAMIDE-IMIDES PREPARED THEREFROM

John T. Hoback and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Oct. 1, 1971, Ser. No. 185,905
Int. Cl. C08f *11/04*; C08g *31/24*
U.S. Cl. 260—46.5 E 9 Claims

Siloxane containing diamine prepolymers are prepared from a reaction mixture of a polysiloxane diamine, trimellitic anhydride and an organic diamine. Subsequently, the silicone containing diamine prepolymers are reacted with organic dianhydrides and subjected to a heat treatment to form polyamide-imide products which are useful as protective coatings having heat resistant and corona resistant properties.

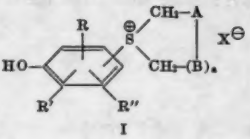
3,723,386

POLYMERS FROM HYDROXYARYLMETHYLENE-SULFONIUM ZWITTERIONS

Melvin J. Hatch, Socorro, N. Mex., and Masao Yoshimine, Hugh B. Smith, and Donald L. Schmidt, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Oct. 15, 1969, Ser. No. 866,763. Divided and this application Mar. 29, 1971, Ser. No. 129,117
Int. Cl. C08g *23/00, 25/00*
U.S. Cl. 260—47 R 10 Claims

Hydroxyarylpolymethylenesulfonium salts of Formula I, prepared by condensation of a phenol and a polymethylenesulfide, can be converted into a sulfonium hydroxide inner salt II and then thermally polymerized to yield polymers containing a plurality of groups of Formula III:



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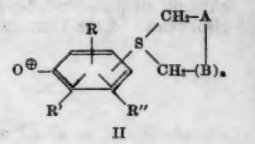
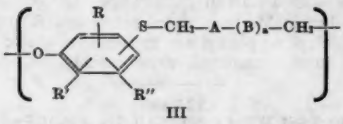


II



III

These polymers and copolymers are useful water resistant thermoplastic resins and impregnants.

3,723,387

PREPARATION OF CURABLE AND CURED FLUOROPOLYMER PRODUCTS

Jack Leland Nyce, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 12, 1971, Ser. No. 142,793
Int. Cl. C08f *15/40, 29/16*
U.S. Cl. 260—47 UP 13 Claims

A curable fluoropolymer which will undergo cross-linking when heated in the presence of a cross-linking agent (e.g. resorcinol) and an acid catalyst (e.g. isopropyltosylate) can be made from a copolymer-forming reaction mixture containing vinylidene fluoride, at least one other fluorinated ethylenically unsaturated monomer containing at least as many fluorine atoms as carbon atoms, and a small amount of allylidene diacetate or acrolein dimethylacetal. The resulting vinylidene fluoride copolymer can be used to make cured or cross-linked fluoropolymer products having beneficial utility in applications where resistance to degradation by steam is required.

3,723,388

PHENOXYPHTHALATE POLYESTERS

Alan Bell and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 8, 1971, Ser. No. 187,841
Int. Cl. C08g *17/08*
U.S. Cl. 260—47 C 10 Claims

Composition of matter comprising a phenoxyphthalate polyester of at least one aromatic diol, and at least in part at least one phenoxyphthalic acid. These polyesters are characterized by their reduced glass transition temperatures, thermal and oxidative stability and high oxygen indices which makes the compositions readily processable into fire-retardant plastics and fibers.

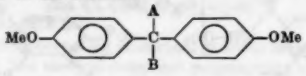
3,723,389

THERMOPLASTIC AROMATIC POLY(ETHER-SULFONES)

Ghazi Khattab, Parsippany, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 27, 1971, Ser. No. 193,195
Int. Cl. C08g 23/00, 25/00
U.S. Cl. 260—49 7 Claims

Polymeric condensation products of about equimolar amounts of p,p'-dihalodiphenyl sulfone with alkali metal bisphenates of the formula



wherein Me is an alkali metal, A and B are hydrogen, alkyl, phenyl or alkali metal carboxylate substituted alkyl, at least one of A and B being alkali metal carboxylate substituted alkyl, or mixtures of the above alkali metal bisphenate with an alkali metal bisphenate of the same formula wherein Me is as stated above and A and B are hydrogen, alkyl or phenyl are resistant to attack by solvents and to environmental stress cracking.

3,723,390

HIGH PRESSURE CONTINUOUS PROCESS FOR POLYESTERS FROM DICARBOXYLIC ACID ANHYDRIDES AND MONOEPOXIDES

Robert E. Carpenter, Minnetonka, and Curtis R. Peterson, Minneapolis, Minn., assignors to Ashland Oil, Inc., Houston, Tex.

No Drawing. Continuation-in-part of application Ser. No. 664,384, Aug. 30, 1967. This application Oct. 22, 1970, Ser. No. 83,190
Int. Cl. C08g 17/007
U.S. Cl. 260—75 M 12 Claims

A process is disclosed for the production of thermoplastic polyester resins via a continuous operation wherein a dicarboxylic acid anhydride and a terminal monoepoxide are condensed under a pressure-temperature-time relationship adapted to efficiently provide products corresponding structurally to conventionally prepared polyesterification products as well as providing unique structurally composed variants thereof.

3,723,391

CONTINUOUS MANUFACTURE OF POLYESTERS

Ludwig Beer, Ludwigshafen, and Hermann Fischer and Eduard Heil, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 18, 1970, Ser. No. 90,574
Claims priority, application Germany, Nov. 22, 1969, P 19 58 777.0
Int. Cl. C08g 17/01
U.S. Cl. 260—75 M 10 Claims

A process for the continuous manufacture of linear polyesters having an intrinsic viscosity of up to 0.40 by polycondensing diglycol terephthalate and/or its precondensates in a bundle of tubes at elevated temperature and reduced pressure. The linear polyesters thus obtained are suitable for film and fiber production.

3,723,392

POLYURETHANES BASED ON 2,3-DIBROMO-BUT-2-ENE-1,4-DIOL

Klaus Konig; Erwin Muller, and Kuno Wagner, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 38,902, May 19, 1970. This application Jan. 17, 1972, Ser. No. 218,470
Claims priority, application Germany, May 24, 1969, P 19 26 661.6
Int. Cl. C08g 22/16
U.S. Cl. 260—75 NP 3 Claims

Noncellular polyurethane plastics are prepared from organic compounds having hydroxyl groups and a molecular weight from about 800 to about 3,000, organic diisocyanates and 2,3-dibromobut-2-ene-1,4-diol. The polyurethane elastomers due to their improved chemical and thermal stability are eminently suitable in the production of molded articles.

3,723,393

AMIDE-TERMINATED POLYETHER PREPOLYMERS AND CURED HYDROPHILIC PRODUCTS THEREOF

John F. Kistner, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed March 25, 1971, Ser. No. 128,171
Int. Cl. C08g 22/04
U.S. Cl. 260—77.5 B 19 Claims

Isocyanato- or haloformyl-terminated hydrophilic polyoxyalkylene prepolymers are reacted with certain compounds containing replaceable hydrogen atoms, such as a hydroxy-, thiol-, or amino amide, ammonia, or a primary amine, to form a hydrophilic amide-endcapped prepolymer. The latter prepolymer can be crosslinked with a crosslinking agent, such as hexamethoxymethylmelamine, under acidic conditions to provide cured or crosslinked water-insoluble hydrophilic materials useful as coatings, films, and molded or shaped articles.

3,723,394

PROCESS FOR THE PREPARATION OF POLYURETHANE PREPOLYMERS COMPRISING TERMINAL ISOCYANATE GROUPS

Alain Gibier-Rambaud, "Clos Zanardi" Chemin des Espeselle, and Bernard Blanc, Ledfeyran Boulevard General Philiffe, both of Martigues, France

Continuation of Ser. No. 804,703, March 5, 1969, abandoned. This application May 28, 1971, Ser. No. 148,237
Int. Cl. G08g 22/04
U.S. Cl. 260—77.5 AA 8 Claims

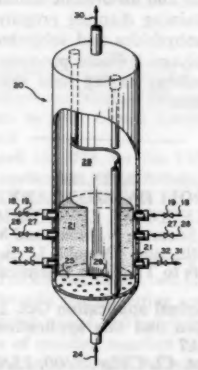
Preparation of polyurethane prepolymers having terminal isocyanate groups comprising reacting an organic polyisocyanate with a polyhydroxylated compound having less than 0.1 percent by weight of water in the presence of a hydrolyzable metal halide at a temperature within the range of 50° to 100° C.

3,723,395

BATCH-CONTINUOUS REACTION PROCESS IN A FLUIDIZED BED

Fred M. Warzell, Taylors, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 826,399, May 21, 1969, Pat. No. 3,615,253. This application May 10, 1971, Ser. No. 141,998
Int. Cl. C08f 3/30, 15/02; F26b 3/08
U.S. Cl. 260—78.5 CL 9 Claims



Material increases in throughput and output of batch-type reactors are obtained by avoiding operational time-losses in

dumping and filling and start-up. The improvements are achieved by a flexible divider which extends upwards from the bottom of the unit and which moves from one side of the reactor to the other to increase and decrease, respectively, the volumes of the sections of the reactor. One section can be functional while the other section is being emptied and refilled. The combined output of the sections approaches the output of a continuous reactor.

3,723,396

CATALYTIC PRODUCTION OF POLYAMIDES FROM AROMATIC DIAMINES

Michael Edward Benet Jones, and Graham Jarrett, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 839,075, July 3, 1969, abandoned. This application April 19, 1971, Ser. No. 135,500

Int. Cl. C08g *20/20*

U.S. Cl. 260—78 R **7 Claims**

A method of producing a polyamide which is of sufficiently high molecular weight to be used in moulding applications or for film or fiber formation from an aromatic diamine, by a high temperature melt procedure comprises heating a diamine component comprising at least one bis(aminophenyl)sulphone with a diacid component comprising at least one dicarboxylic acid at a temperature of from 160° to 300°C under an inert atmosphere and in the presence of a catalytic amount of a salt of hypophosphorous acid and an organic base having a pK_a of less than 3, the salt being put in the reaction mixture before the latter reaches 150°C. Preferably the organic base is the bis(aminophenyl)sulphone used as the diamine component and the salt is formed in situ by addition of the hypophosphorous acid or a compound or compounds which will produce this acid in the reaction mixture.

3,723,397

ETHYLENE/VINYL ESTER/CARBOXYLIC ACID COPOLYMERS

George L. K. Hoh, and Donald E. Tuites, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 726,242, May 2, 1968, Pat. No. 3,594,338. This application Feb. 2, 1971, Ser. No. 112,084

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.8 **2 Claims**

Ethylene/vinyl ester/carboxylic acid copolymers containing at least 35 weight percent vinyl ester and at least 0.5 weight percent monocarboxylic or dicarboxylic acid or the half ester of the latter. The copolymers are particularly suitable in nitrocellulose lacquers for coating metal substrates where enhanced flexibility and adhesion are required.

3,723,398

THERMOSETTING POLYMERS DERIVED FROM COMPOUNDS OF FIVE AND SIX MEMBERED CYCLIC ALPHA, BETA-UNSATURATED ETHERS

Rostyslaw Dowbenko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 4,120, Jan. 19, 1970, Pat. No. 3,637,760, which is a continuation-in-part of Ser. No. 671,990, Oct. 2, 1967, abandoned. This application May 7, 1971, Ser. No. 141,449

Int. Cl. C08f *15/00, 15/40*

U.S. Cl. 260—80.72 **8 Claims**

Compounds containing 2-tetrahydropyranyloxy groups or 2-tetrahydrofuranyloxy groups are formed by reacting carboxylic acid esters containing hydroxyl groups with 2,3-dihydropyran or 2,3-dihydrofuran. Preferred embodiments include 2-(2-tetrahydropyranyloxy)ethyl acrylate, 2-(2-tetrahydropyranyloxy)ethyl methacrylate, and butyl 2-(2-tetrahydropyranyloxy)ethyl fumarate. Homopolymers and interpolymers of the 2-tetrahydropyranyloxy and 2-tetrahydrofuranyloxy compounds with other ethylenic monomers are useful as films and coatings which cure very rapidly at low temperatures and are solvent resistant.

3,723,399

COPOLYMERS OF OLEFINS OR OLEFINS AND NON-CONJUGATED DIENES WITH NORBORNENE DERIVATIVES

Yves Amiard, Pau; Jean-Paul Bellissent, Billere, and Gilbert Marie, Pau, all of France, assignors to Societe Nationale des Petroles D'Aquitaine, Tour Aquitaine Courbevoie, France

Filed May 11, 1971, Ser. No. 142,417

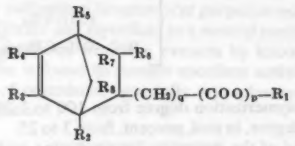
Claims priority, application France, May 11, 1970, 7017017

Int. Cl. C08f *15/40*

U.S. Cl. 260—80.73 **20 Claims**

Preparation of new copolymers of olefins or olefins and non-conjugated dienes with norbonene derivatives, by co-ordination catalysis.

The norbornene derivatives are selected from those with the formula



where q is an integer which may equal from 0 to 12, p equals 0 or 1, R_1 represents a pyridyl radical, where p equals 0, and an alkyl radical, where p equals 1, and R_2 to R_8 represent hydrogen or hydrocarbon radicals with from one to 12 carbon atoms. These derivatives are, notably, the adducts of cyclopentadiene and vinylpyridine or alkyl acrylates or methacrylates.

3,723,400

METHOD OF PRODUCING 1,4-CIS-POLYBUTADIENE AND CIS-COPOLYMERS OF BUTADIENE

Boris Alexandrovich Dolgoplosk, Vystavochny pereulok, 3, kv. 36; Elena Ivanovna Tinyakova, ulitsa Krasikova, 19, kv. 104; Solomon Isaakovich Beilin, proezd Shokalskogo, 39, kv. 43; Kirill Lvovich Makovetsky, ulitsa Dybenko, 38, kv. 8; Galina Moiseevna Chernenko, ulitsa Alabyana, 3, kv. 330; Irina Yakovlevna Ostrovskaya, prospekt Mira, 72, kv. 2, all of Moscow; Izmail Vladimirovich Garmonov, ulitsa Saltykova-Schedrina, 20, kv. 18, Leningrad; Boris Vasilievich Mamontov, Narvsky prospekt, 8, kv. 11, Leningrad, and Alexandra Kon, Budapeshtskaya ulitsa, 23, korpus 2, kv. 151, Leningrad, all of U.S.S.R.

Filed Dec. 30, 1970, Ser. No. 102,912

Claims priority, application U.S.S.R., Dec. 31, 1969, 1391000; Dec. 31, 1969, 1392358

Int. Cl. C08d *1/30;* **C08f** *19/04;* **C08d** *3/06*

U.S. Cl. 260—82.1 **8 Claims**

A method of producing 1,4-cis-polybutadiene and cis-copolymers of butadiene with conjugated cyclic dienes having a number of carbon atoms of 5 to 6 or with vinyl-aromatic compounds which involves homopolymerization or copolymerization of the butadiene with monomers. The process is effected in mass or in a medium of an inert hydrocarbon solvent in the presence of a catalyst consisting of nickel or cobalt halide applied onto an inorganic carrier having electron acceptor characteristics and subjected to thermal activation at a temperature of 150°–350°C and under a vacuum of 10^{-3} to 10^{-1} mm Hg.

3,723,401

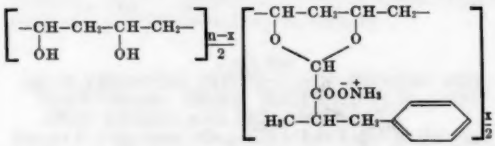
POLYMERIC DERIVATIVE OF 1-PHENYLISOPROPYLAMINE WITH CARBOXYFORMAL OF POLYVINYL ALCOHOL, METHOD OF PRODUCING AND APPLICATION THEREOF

Nadezhda Alexandrovna Kashkina; Milda Yanovna Pormale; Arvid Yanovich Kalninsh; Yan Alexandrovich Surna; Yanis Yanovich Baltkajs, and Yan Shuster, all of Riga, U.S.S.R., assignors to Institut Khimii Drevesiny Akademii Nauk Latuliskoi SSR

Filed Sept. 11, 1970, Ser. No. 71,340
Int. Cl. C08f 27/08
U.S. Cl. 260—91.3 VA 3 Claims

The present invention relates to a new compound which is a polymeric derivative of 1-phenylisopropylamine with carboxyformal of polyvinyl alcohol, to a method of their producing and application.

Said polymeric derivative of 1-phenylisopropylamine with carboxyformal of polyvinyl alcohol conforms to the general formula



where n is polymerization degree from 100 to 1,200, and x is substitution degree, in mol. percent, from 3 to 25.

The method of the invention for producing said polymeric derivative of 1-phenylisopropylamine with carboxyformal of polyvinyl alcohol consists in that carboxyformal of polyvinyl alcohol is reacted with 1-phenylisopropylamine in an aqueous medium, and the desired product is subsequently isolated.

Said compound is an active principle of a medicinal preparation of a psycho-stimulating effect.

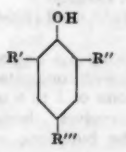
3,723,402

COMPOSITION COMPRISING POLYPROPYLENE AND AN ORGANOSILICON COMPOUND

William J. Owen, Penarth, and Bryan E. Cooper, Bridgend, both of Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England

Filed July 20, 1970, Ser. No. 56,659
Claims priority, application, England, July 23, 1969, 37,057/69
Int. Cl. C08f 29/02, 45/58, 45/60
U.S. Cl. 260—93.7 3 Claims

The production of shaped polypropylene articles by melt extrusion of thermally degraded isotactic polypropylene can be carried forward at lower temperatures than were heretofore required by incorporating in the polypropylene prior to thermal degradation thereof, from 0.01 to 5 percent by weight, based on the weight of the polypropylene, or (a) a silane or siloxane having at least one $SiCH_2NR_2$ group where R is hydrogen or a hydrocarbon radical, (b) an organosilicon compound of the general formula



wherein R′, R″ and R‴ are each a hydrogen atom, an alkyl radical of 1–18 carbon atoms, an aralkyl radical of less than 19 carbon atoms or O_2SiCH_2 — where Q is alkyl, alkenyl or aryl of less than 19 carbon atoms, at least one R′, R″ or R‴ being Q_2SiCH_2, or (c) mixture of (a) and (b).

3,723,403

OLEFINE POLYMERIZATION AT HIGH PRESSURES USING A DISPERSED ZIEGLER-TYPE CATALYST

Jeffrey Chester Greaves, and William George Oakes, both of Welwyn Garden City, England, assignors to Imperial Chemical Indusries Limited, London, England

Continuation-in-part of Ser. No. 728,347, May 9, 1968, abandoned. This application Oct. 30, 1969, Ser. No. 872,742
Claims priority, application Great Britain, Oct. 30, 1968, 51,471/68; Nov. 8, 1968, 53,064/68
Int. Cl. C08f 3/04, 1/42
U.S. Cl. 260—94.9 B 12 Claims

Ethylene is polymerized at high temperature and high pressure using a finely divided Ziegler catalyst comprising an organo-aluminium compound and a titanium trihalide which has been finely divided by pre-treatment with an α-olefine or mixture thereof under conditions to form an amorphous polymer. The titanium trihalide can be titanium trichloride which has been prepared by the reduction of titanium tetrachloride with hydrogen, aluminum, or, preferably, an organo-aluminium compound.

3,723,404

CHLORONITROSYLATED POLYMERS AND A PROCESS FOR THE PREPARATION THEREOF

Pauls Davis, Gibraltar, and Herwart C. Vogt, Grosse Ile, both of Mich., assignors to Basf Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 21, 1970, Ser. No. 4,756
Int. Cl. C08f 27/02, 27/08, 27/00, 27/03; C08d 5/04
U.S. Cl. 260—94.9 GB 10 Claims

Polymers containing chlorine and nitrogen atoms are prepared by the reaction of a hydrocarbon polymer with nitrosyl chloride or chlorine and nitric oxide. The resulting polymers may be cross-linked with heat to provide polymers having improved physical properties.

3,723,405

TECHNIQUE FOR BONDING ANTIOXIDANTS TO POLYMER FILMS

Martin Louis Kaplan, Whippany, and Paul Goggin Kelleher, Maplewood, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 10, 1972, Ser. No. 242,792
Int. Cl. C08f 27/08
U.S. Cl. 260—94.9 GB 8 Claims

A technique is described for stabilizing polyolefins against degradation attributed to thermal oxidation. The described technique involves bonding a carbene, obtained by the decomposition of 3,5-ditertiarybutylbenzene-1,4-diazooxide, to the alpha olefin.

3,723,406

NORREL PEPTIDES HAVING CHOLECYSTORININ ACTIVITY AND INTERMEDIATES THEREFOR

Miguel A. Ondetti, North Brunswick; Josip Pluscec, East Brunswick; John T. Sheehan, Middlesex, all of N.J.; Johan E. Jorpes, Stockholm, and Viktor Mutt, Farsta, both of Sweden, assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Division of Ser. No. 726,558, May 3, 1968. This application Dec. 23, 1969, Ser. No. 889,768
Int. Cl. C07c 103/52; C07g 7/00
U.S. Cl. 260—112.5 9 Claims

Novel peptides amides of the general formula

R—Met—Gly—Trp—Met—Asp—Phe—NH_2

wherein R represents L-aspartyl-O-sulfate-L-tyrosyl, L-aspartyl-L-arginyl-L-aspartyl-O-sulfate-L-tyrosyl, or isoleucyl-L-seryl-L-aspartyl-L-arginyl-L-aspartyl-O-sulfate-L-tyrosyl, and intermediates in the production thereof. The peptide amides of this invention as well as the pharmaceutically acceptable salts thereof have been found to possess cholecystokinin activity.

3,723,407

METHOD OF PREPARING VEGETABLE PROTEIN CONCENTRATES

David M. Miller, Forest Park, and Morris D. Wilding, Downers Grove, both of Ill., assignors to Swift & Company, Chicago, Ill.

Continuation of Ser. No. 79,655, Oct. 9, 1970, abandoned. This application April 13, 1972, Ser. No. 243,868

Int. Cl. A23j 1/14

U.S. Cl. 260—123.5 10 Claims

Vegetable protein concentrates of high viscosity are obtained by contacting undenatured, defatted, vegetable protein source material with an aqueous system, acidifying said system and subjecting the material to centrifugal speeds and differential pressure effects while passing it through a shearing orifice so as to disrupt the natural cell structure of the protein bodies. Subjecting the protein material, in a concentrate process, to a momentary pressure build-up and sudden release of the cellular tissue of the protein bodies gives a released protein that has markedly different viscosity properties than are possessed by protein concentrates prepared in accordance with prior art procedures.

3,723,408

HYDROXYALKYL POLYGALACTOMANNANS BY REACTION WITH CERTAIN HALO FATTY ACID COMPOUNDS

Robert Nordgren; Duane A. Jones, and Harold A. Wittcoff, all of Minneapolis, Minn., assignors to General Mills Chemicals, Inc.

Filed May 26, 1970, Ser. No. 40,744

Int. Cl. C07c 47/18

U.S. Cl. 260—209 R 2 Claims

The hydration rate of hydroxyalkyl polygalactomannans is improved by reaction with certain halo fatty acids or the alkali metal salts thereof. Such products find utility as thickeners for various fluids.

3,723,409

MIXED DERIVATIVES OF POLYGALACTOMANNANS AND PROCESS OF PREPARING SAME

Mao H. Yueh, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed May 26, 1970, Ser. No. 40,746

Int. Cl. C07c 47/18

U.S. Cl. 260—209 R 2 Claims

Carboxyalkyl hydroxyalkyl derivatives of polygalactomannans are prepared by reacting the polygalactomannan with both an alkylene oxide of three to eight carbon atoms and a halo fatty acid of two to four carbons or the alkali metal salts thereof. The products find use as thickeners for aqueous fluids when complexed with di- or polyvalent metal ions.

3,723,410

METHOD OF PRODUCING STEVIOSIDE

Georgia J. Persinos, Rockville, Md., assignor to The Amazon Natural Drug Company, Somerville, N.J.

Filed Dec. 1, 1970, Ser. No. 94,628

Int. Cl. C07c 47/18

U.S. Cl. 260—210 R 9 Claims

A new and improved method for the extraction of stevioside from the leaves of *Stevia rebaudiana* in which the leaves are ground, defatted, treated with an organic extractant, filtered. the resultant filtrate reduced to a syrup, and the syrup thereafter treated by one or more steps to form crystals of stevioside.

3,723,411

BETA-RHODOMYCIN V

Hans Brockmann, Goettingen, and Martin Scheer, Wuppertal-Elberfeld, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

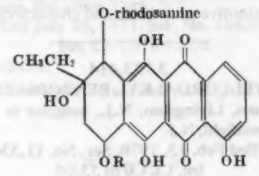
Filed March 12, 1971, Ser. No. 123,882

Claims priority, application Germany, March 18, 1970, P 20 12 808.9

Int. Cl. C07c 47/18

U.S. Cl. 260—210 AB 1 Claim

An antibiotic designated β-rhodomycin V and corresponding to the formula



wherein R represents a tetraglycoside consisting of 2 mols rhodinose, 1 mol 2-desoxy-fucose and 1 mol rhodosamine is prepared by cultivating *Streptomyces purpurascens*, extracting the culture filtrate and mycelium in a neutral medium and obtaining the antibiotic from the extracts by known methods. The antibiotic is found to possess excellent activity against a broad class of organisms, especially mycoplasmas and gram-positive bacteria.

3,723,412

PREPARATION OF ACETONE GLUCOSE

James P. Hicks, Galesbury; Robert E. Gramera, Hindsdale, and Hyman M. Molotsky, Chicago, all of Ill., assignors to CPC International Inc., 02

Original application Feb. 13, 1967, Ser. No. 615,307, now Patent No. 3,538,116, dated Nov. 3, 1970. Divided and this application Jan. 26, 1970, Ser. No. 10,698

Int. Cl. C07c 47/18

U.S. Cl. 260—210 R 5 Claims

Covers a method of preparing acetone glucose. Particularly covers a process of making diacetone glucose under carefully controlled conditions via an acid-catalyzed reaction. Also covers a procedure for making monoacetone glucose from diacetone glucose through ion exchange techniques. In addition, covers a continuous method of synthesizing diacetone glucose, and as well is concerned with synthesizing monoacetone glucose from glucose by proceeding through the intermediate diacetone glucose without isolation of the diacetone derivative.

3,723,413

WATER-INSOLUBLE FLUID-ABSORPTIVE AND RETENTIVE MATERIALS AND METHODS OF MAKING THE SAME

Pronoy K. Chatterjee, Spotswood, and Michael C. Kwok, Princeton, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Filed Oct. 26, 1970, Ser. No. 84,129

Int. Cl. C08b 11/00, 11/20

U.S. Cl. 260—232 12 Claims

Water-insoluble, fluid-absorptive and retentive carboxyalkylated cellulosic materials having an average degree of substitution greater than 0.35 and up to about 1.4 or more carboxyalkyl radicals per anhydroglucose unit in the cellulose and methods of making the same which comprise: (1) treating cellulosic materials such as wood pulp, cotton, cotton linters, rayon, etc., with carboxyalkylating reactants such as chloroalkanoic acids, preferably monochloroacetic acid, and an alkali, such as sodium hydroxide, in the presence of an alcohol, such as propanol, to form water-soluble carboxyalkyl cellulose hav-

ing an average degree of substitution (D.S.) greater than 0.35 and up to about 1.4 or more carboxyalkyl radicals per anhydroglucose unit in the cellulose, but possessing poor liquid absorptive and retentive properties and characteristics; (2) removing a portion of the carboxyalkylating reactants and by-products, residues, and impurities formed during the reaction so that there remains at least about 3 or 4 percent and preferably less than about 50 percent by weight thereof, based on the weight of the water-soluble carboxyalkyl cellulose; and (3) heat-treating the carboxyalkyl cellulose in the presence of the remaining carboxyalkylating reactants and by-products, residues and impurities formed in the reaction whereby it becomes water-insoluble and possesses excellent liquid absorptive and retentive properties and characteristics.

3,723,414

1-POLYFLUOROALKYL BENZODIAZEPINES

Martin Steinman, Livingston, N.J., assignor to Schering Corpration, Bloomfield, N.J.

Filed Feb. 13, 1970, Ser. No. 11,336

Int. Cl. C07d *53/06*

U.S. Cl. 260—239 BD **4 Claims**

Disclosed herein are 1-(polyfluoroalkyl)-2,3-dihydro-5-aryl-1H-1,4-benzodiazepines and compounds useful as intermediates for preparing these benzodiazepines. These benzodiazepines are particularly useful as anti-anxiety agents.

3,723,415

HERBICIDAL N-OCTAHYDRO-1,2,4-METHENOPENTALENYL-(5)-UREAS

Claus Dieter Weiss, Arlesheim, Baselland, and Jurg Rumpf, Binningen, Baseland, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

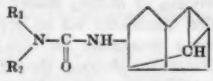
Division of Ser. No. 691,200, Dec. 18, 1967, Pat. No. 3,555,086. This application Sept. 4, 1970, Ser. No. 69,975

Claims priority, application Switzerland, Dec. 22, 1966, 18376/66

Int. Cl. C07d *87/42*

U.S. Cl. 260—239 A **1 Claim**

New herbicidal compounds of the formula



in which R_1 and R_2 represent hydrogen or certain substituents are described as particularly suitable for controlling weeds and undesirable grasses. Compositions containing these compounds as active ingredients in mixture with agriculturally acceptable carriers and a method of controlling weeds and undesirable grasses with the aid of such compounds or compositions containing them are also described, as well as novel intermediates which are methenopentalene derivatives from which the compounds of the above formula can be produced.

3,723,416

SUBSTITUTED 2-ARYLALKYLOXY BENZAMIDES

Michel Leon Thominet, Paris, France, assignor to Societe D'Etudes Scientifigues et Industrielles de L-Ile-de'France, Paris, France

Continuation-in-part of Ser. No. 714,795, March 21, 1968, Pat. No. 3,594,417. This application Jan. 22, 1971, Ser. No. 108,963

Claims priority, application France, April 3, 1967, 67101328; June 23, 1967, 67111808

Int. Cl. C07d *29/30*

U.S. Cl. 260—239 BF **10 Claims**

The 2-arylalkyloxy-benzamides of this invention are useful for the production of anesthesia, such as local anesthesia, in mammals. When administered intramuscularly, compounds of this invention show significant anesthesia when compared with xylocaine. Again, intradermic injections of 0.2 ml. of a solution of such a compound in concentrations varying from 0.1 to 1.25 mg./ml. effect suppression of platysma tremor produced by the prick of a pin in guinea pigs. The LD_{50} dosage of the compounds evaluated on mice and rats proved compatible in therapeutic use on mammals.

3,723,417

SYNTHESIS OF CHALCOGENATED POLYACENES

Evelio A. Perez-Alberne, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1971, Ser. No. 149,056

Int. Cl. C07d *11/00, 77/00, 81/00, 83/00*

U.S. Cl. 260—239 R **12 Claims**

Chalcogenated polyacenes including organic semiconductors such as tetrathiotetracene, tetraselenotetracene, and hexathiopentacene are produced by reaction of a polyacene with elemental sulfur, selenium, and tellurium in the presence of nitrogen-containing hot solvents, preferably alkylated amides. N,N-dimethylformamide is the preferred solvent. The disclosed method of synthesis produces substituted polyacenes of high yield and purity in considerably shorter reaction times than achievable by prior art methods.

3,723,418

PROCESS FOR THE MANUFACTURE OF BETA-HYDRO XY-STEROID-KETONES

Oskar Jeger, Zollikerberg, Zurich; Hans Ueli Wehrli, Schaffhausen, and Kurt Schaffner, Zurich, all of Switzerland, assignors to Ciba-Geigy Corporation, New York, N.Y.

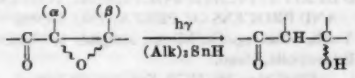
Division of Ser. No. 743,278, July 9, 1968, Pat. No. 3,565,778. This application Nov. 13, 1970, Ser. No. 89,527

Claims priority, application Switzerland, July 13, 1967, 10108/67

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **11 Claims**

α,β-Oxido-steroid-ketones are converted into β-hydroxy-ketones according to the partial formulas scheme



when they are treated with tri-n-butylstannane in an organic solvent while irradiating with ultraviolet light. New types of β-hydroxy-steroid-ketones are inter alia 17-oxygenated-7-methyl-5-hydroxy-3-oxo-androstanes and 19-nor-androstanes, especially the 7α-methyl-derivatives and corresponding Δ^1-steroids without the 7-methyl group.

3,723,419

PREPARATION OF FORMYLMETHYLENE COMPOUNDS AND CORRESPONDING PHOTOGRAPHIC DYESTUFFS

John D. Mee, and Donald W. Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1967, Ser. No. 639,030

Int. Cl. C09b *23/06*

U.S. Cl. 260—240.6 **3 Claims**

Formylmethylene dye intermediates are prepared by reacting a heterocyclic quaternary salt with a complex of dialkylformamide and inorganic acid halide followed by hydrolysis. Cyanine dyes are prepared by reacting such formylmethylene dye intermediates with heterocyclic quaternary salt.

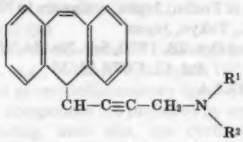
3,723,420

DERIVATIVES OF DIBENZO(A,D)5H-CYCLOHEPTENE, METHOD OF PREPARATION, AND APPLICATION THEREOF

Frajda Dvolaitzky, Paris; Jean-Claude Cognacq, Bourg-la-Reine, and Esther Ber, Paris, all of France, assignors to Societe Civile Auguil, Paris, France

Filed May 20, 1970, Ser. No. 39,148
Claims priority, application France, May 20, 1969, 6916251
Int. Cl. C09b 29/12
U.S. Cl. 260—240 TC 29 Claims

New chemical compound of the formula



wherein R^1 and R^2 are each selected from the group consisting of alkyl or hydroxyalkyl, or where

forms part of a heterocycle; and acid addition salts thereof. These compounds are active on the central nervous system and on the cardiovascular system.

3,723,421

3-(SUBSTITUTED AMINO)-1H-ISOINDOLES

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,701
Int. Cl. C07d 27/48
U.S. Cl. 260—240 F 20 Claims

3-(Substituted or unsubstituted amino)-1H-isoindoles, prepared by condensing 3-alkoxy-1H-isoindoles or 3-(chloro or bromo)-1H-isoindoles with amine derivatives and optionally acylating the resulting 3-(primary or secondary amino)-1H-isoindoles or condensing the resulting 3-hydrazino-1H-isoindoles with an aldehyde or a ketone, are useful as antibacterial agents and as antihypertensive agents.

3,723,422

2-IMINO-3-THIAZOLINE CYANINE DYES

Philip W. Jenkins, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 660,172, Aug. 14, 1967, Pat. No. 3,574,629. This application Nov. 13, 1970, Ser. No. 89,523
Int. Cl. C09d 23/10
U.S. Cl. 260—240 E 2 Claims

Novel cyanine dyes are provided which comprise first and second five- to six-membered nitrogen containing heterocyclic nuclei joined by a methine linkage; the first of said nuclei being a 2-arylimino (or alkylimino)-4-aryl (or alkyl)-3-thiazoline nucleus joined at the five-carbon atom thereof to said linkage; and said second nucleus being joined at a carbon thereof to said linkage, to complete said cyanine dye.

3,723,423

NOVEL ALKOXYTETRAHYDROPYRANOL ETHERS OF PROSTAGLANDINS

Niels H. Andersen, Seattle, Wash., and Ned M. Weinshenker, Sunnyvale, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Filed Jan. 22, 1971, Ser. No. 108,989
Int. Cl. C07c 61/36; C07d 7/04
U.S. Cl. 260—240 R 27 Claims

Novel 4′-lower alkoxytetrahydropyran-4′-yl ethers of prostaglandins. The compounds possess valuable pharmacological properties as modifiers of smooth muscle activity, gastric secretion, blood pressure, lipolysis and the reproductive system. The compounds also induce labor and menses and they can be used for the relief of asthma and nasal congestion. The compounds also have valuable pharmacological properties, as platelet anti-clumping agents and for the inhibition of peptic ulcers.

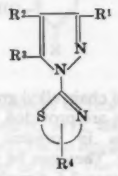
3,723,424

PYRAZOLE DERIVATIVES

Rudiger D. Haugwitz, Highland Park, and Venkatachala L. Narayanan, Highstown, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed July 28, 1971, Ser. No. 166,972
Int. Cl. C07d 93/06
U.S. Cl. 260—243 R 7 Claims

Pyrazole derivatives are provided having the structure



and which are useful as anthelmintic agents.

3,723,425

BRIGHTENERS OF THE BIS-S-TRIAZINYLAMINOSTILBENE SERIES

Hans Ackermann, Bottmingen, Baselland, and Gerhard Creutzburg, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,484
Int. Cl. C09d 23/00
U.S. Cl. 260—240 B 7 Claims

New 4,4′-bis-[4″-cyanamino-s-triazinyl-(2″)-amino]-stilbene-2,2′-disulphonic acids and salts thereof are brighteners for organic materials. They are prepared by reacting a 2,4,6-trichloro-s-triazine with 4,4′-diaminostilbene-2,2′-disulphonic acid, with the alkali metal salt of a cyanamide and optionally with an alcohol, phenol or an amine.

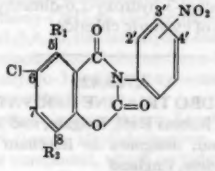
3,723,426

BENZOXAZINEDIONES

Charles H. Fuchsman, Cleveland Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 24, 1971, Ser. No. 118,544
Int. Cl. C07d 87/10
U.S. Cl. 260—244 R 4 Claims

Novel benzoxazinediones of the formula:



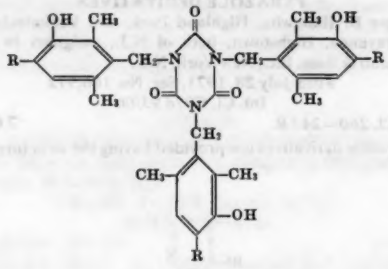
wherein R^1 is hydrogen or methyl and R^2 is hydrogen, alkyl of from one to four carbon atoms, or aralkyl of from seven to 11 carbon atoms; and to a method of controlling sea lamprey.

3,723,427
HINDERED TRIS(META-HYDROXYBENZYL)CYANURATE ANTIOXIDANTS

Peter Vincent Susi, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 16, 1971, Ser. No. 199,340
Int. Cl. C07d 55/38
U.S. Cl. 260—248 NS 2 Claims

Compounds of the formula:



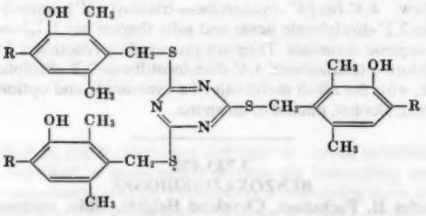
wherein R is a branched chain alkyl group containing three to about 12 carbon atoms are provided. These compounds are useful as antioxidants in organic substrates, such as polyolefins, rubber, etc. They can be prepared by reacting 3 moles of 4-alkyl-3-hydroxy-2,6-dimethylbenzyl chloride with 1 mole of cyanuric acid.

3,723,428
HINDERED TRIS(META-HYDROXYBENZYLTHIO)-S-TRIAZINE ANTIOXIDANTS

John Song, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 16, 1971, Ser. No. 199,341
Int. Cl. C07d 55/50
U.S. Cl. 260—248 CS 2 Claims

Compounds of the formula:



wherein R is a branched chain alkyl group containing three to about 12 carbon atoms are provided. These compounds are useful as antioxidants in organic substrates, such as polyolefins, rubber, etc. They can be prepared by reacting three moles of 4-alkyl-3-hydroxy-2,6-dimethylbenzyl chloride with one mole of 2,4,6-trimercapto-s-triazine or by reacting three moles of 4-alkyl-3-hydroxy-2,6-dimethylbenzyl mercaptan with one mole of cyanuric chloride.

3,723,429
DI-HYDRO TRIAZINE DERIVATIVES

Patrick Mamalis, Robins Ruff, Reigate, and Dennis J. Outred, both of England, assignors to Beecham Group Limited, Brentford, Middese, England

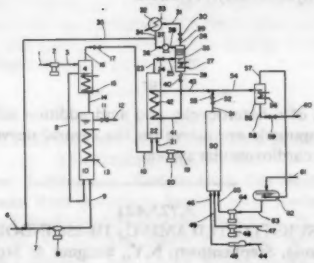
Filed Nov. 6, 1969, Ser. No. 874,693
Int. Cl. C07d 55/20
U.S. Cl. 260—249.9 6 Claims

N-substituted symmetrical di-hydrotriazine derivatives and salts are described having anti-malarial and antibacterial activity as well as effectiveness against some fungi and protozoa. A representative compound is 4,5-diamino-1,2-dihydro-2,2-dimethyl-1-[3'-(2,4,5-trichlorophenoxy)propyloxy]-1,3,5-triazine hydrobromide. The compounds can be prepared by reacting a substituted diguanide with a carbonyl compound in the presence of an acid catalyst to form a substituted triazine which may then be salified or acylated.

3,723,430
METHOD FOR RECLAMATION OF MELAMINE WASTE GAS

Ryo Kokubo; Koji Yokomichi; Yasuo Takakuwa, and Kozo Takahashi, all of Fuchu, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Oct. 28, 1970, Ser. No. 84,797
Int. Cl. C07d 55/28
U.S. Cl. 260—249.7 A 15 Claims



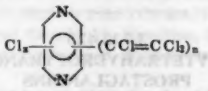
Method for utilization of melamine waste gas in high pressure liquid phase melamine synthesis using urea or urea-thermal decomposition product as initial material, — characterized by synthesizing urea under the melamine synthesis pressure directly from melamine waste gas obtained as by-product in the synthesis or, depending on the case, with water or aqueous ammonium carbonate solution added thereto, and introducing the obtained lower pressure urea synthesis solution into decomposing stage of main urea synthesis.

3,723,431
PERCHLORINATED VINYL PYRAZINES

Sven H. Ruetman, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1971, Ser. No. 110,753
Int. Cl. C07d 51/76
U.S. Cl. 260—250 R 2 Claims

Compounds corresponding to the formula



wherein x is 2 or 3, n is 1 or 2 and the sum of $x+n$ is always 4. These compounds are prepared by vapor phase chlorination and have utility as pesticides for the control of a variety of plant, insect, bacterial and fungal pests.

3,723,432

1-SUBSTITUTED-4-ARYL-2(1H)-QUINAZOLINONES AND THEIR PREPARATION

Hans Ott, Pfeffingen, Basel-Land, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 741,804, July 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 707,932, Feb. 26, 1968, abandoned, which is a continuation-in-part of Ser. No. 672,739, Oct. 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 636,015, May 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 575,511, Aug. 29, 1966, abandoned. This application Nov. 12, 1968, Ser. No. 775,201

Int. Cl. C07d *51/48*

U.S. Cl. 260—251 QB 70 Claims

Compounds are of the class of 1-substituted-4-aryl-2(1H)-quinazolinones, e.g., 1-ethyl-4-phenyl-2(1H)-quinazolinone, which are useful as anti-inflammatory agents, antipyretics and analgesics. The compounds are prepared by any one of several processes including, inter alia, the cyclization of a 2-alkylaminobenzophenone with urethane, the cyclization of a 2-alkylaminobenzophenonimine with phosgene, the reaction of a 1-alkali metal salt of a 4-aryl-2(1H)-quinazolinone with an alkyl halide or from a 1-unsubstituted-4-arylquinazoline which is reacted with a methyl halide to form the corresponding 1-methyl-quinazolinium halide which is either then directly oxidized or first reduced and then oxidized to obtain the 1-methyl-4-aryl-2(1H)-quinazolinone. Novel intermediates disclosed include the 1-methyl-4-aryl-quinazoliniums and compounds which are 1-methyl-4-aryl-3,4-dihydroquinazolines.

3,723,433

PYRIMIDINYLPYRAZOLE DERIVATIVES AND METHODS FOR PREPARING THE SAME

Katsuhiro Ueno; Yoshiaki Ohmura; Reimei Moroi; Akira Akashi; Masahiro Arimoto, and Akira Kasahara, all of Tokyo, Japan, assignors to Daiichi Seiyaku Co., Ltd., Tokyo, Japan

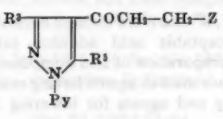
Filed July 31, 1970, Ser. No. 60,112

Claims priority, application Japan, Aug. 2, 1969, 44/61218; Aug. 15, 1969, 44/64542

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.4 C 32 Claims

Pyrimidinylpyrazole derivatives, having the formula:



(I)

wherein R_3 and R_4 are each hydrogen or alkyl of one to five carbon atoms, Py is a pyrimidinyl group optionally substituted by alkyl of one to five carbon atoms, alkoxy of one to five carbon atoms, and/or halogen, Z is N-(optionally substituted)phenyl piperazino, 4-substituted piperidino or 4-substituted-1,2,5,6-tetrahydro pyridino. The compounds are useful either as C.N.S. depressants or as antihypertensive agents.

3,723,434

PIPERAZINO ISOQUINOLINE BRONCHODILATORS

Timothy H. Cronin, Niantic, and Hans-Jurgen E. Hess, Old Lyme, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed July 17, 1970, Ser. No. 55,964

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 C 9 Claims

A series of novel 4-piperazino-6,7-dialkoxyquinazolines and 1-piperazino-6,7-dialkoxyisoquinolines have been prepared, including their acid addition salts. These compounds are useful in therapy as bronchodilators and as smooth muscle relaxants. Methods for their preparation from known compounds are provided.

3,723,435

METAL COMPLEXES OF MERCAPTO QUINOLINE N-OXIDES

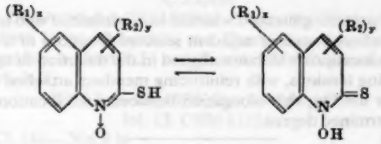
Thomas E. Furia, Hartsdale, and David H. Steinberg, Bronx, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 16, 1969, Ser. No. 842,377

Int. Cl. C07d *33/62*

U.S. Cl. 260—270 R 4 Claims

Novel compounds having the structural formula in tautomeric form:



and metal salts and complexes thereof wherein R_1 and R_2 are hydrogen, alkyl, cycloalkyl, aryl, alkylthio, halogen, nitro, trifluoromethyl or alkoxy; x is an integer from one to four and y is an integer from one to two. The invention also includes anti-dandruff shampoos containing the above metal salts and complexes and to a method of combatting dandruff comprising applying to the hair and scalp a detergent composition containing the above metal complexes.

3,723,436

PROCESS FOR AROMATIC LACTAMS

Elmer J. Hollstein, Wilmington, Del., and Arthur M. Brownstein, Cherry Hill, N.J., assignors to Sun Oil Company, Philadelphia, Pa.

Filed Feb. 25, 1971, Ser. No. 119,003

Int. Cl. C07d *39/00*

U.S. Cl. 260—281 4 Claims

A process for the preparation of aromatic lactams which comprises hydrogenating an aromatic polycarboxylic acid in the presence of a Raney cobalt catalyst.

3,723,437

4,10-(METHANIMINOMETHANO PHENANTHRENE DERIVATIVES

Karel Wiesner, Fredericton, New Brunswick, Canada, assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 846,962, Aug. 1, 1969, abandoned. This application Sept. 15, 1970, Ser. No. 72,508

Int. Cl. C07d *35/28*

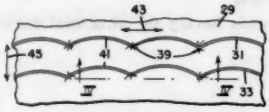
U.S. Cl. 260—285 5 Claims

There are disclosed herein organic amines, and their pharmaceutically acceptable acid addition salts, which are 3,4,9,10-tetrahydro-6-methoxy-(2H)-4a,10-(methaniminomethano)-phenanthren-2-o1, 1,3,4,9,10,10a-hexahydro-6-methoxy-(2H)-4a,10-(methaniminomethano)-phenanthren-2-o1,3,4,10,10a-tetrahydro-6-methoxy-(9H)-4a,10-(methaniminomethano)phenanthren-3-o1 and 1,2,3,4,9,10-hexahydro-3,6-dimethoxy-α-methyl-α-alkyl-or aralkyl-3,10a-ethano-4a,10-(methaniminomethano)phenanthrene-2-methanol and their corresponding N-(lower alkyl)derivatives. Process for the synthesis of these compound, which includes a facile preparation of the key intermediate, 3,4,9,10-tetrahydro-6-methoxy-12-methyl-4a,10-(methaniminomethano)phenanthrene-2,11(2H)-dione, is also disclosed. The amines possess analgesic, antibacterial and antifungal activities, and methods for their use are disclosed.

3,723,438
WEB STRETCHING METHOD

Theodore H. Fairbanks, Liverpool, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 13, 1970, Ser. No. 54,196
Int. Cl. B29d 7/24
U.S. Cl. 264—289 8 Claims



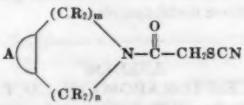
Web stretching method wherein an unstretched web is elongated between each of adjacent selected locations of a series of such locations which are aligned in the direction of applied stretching tensions, with reinforcing members attached to the web for limiting web elongation between such locations to a predetermined degree.

3,723,439
THIOCYANOACETAMIDES

Sidney B. Richter, Chicago, and Alfred A. Levin, Skokie, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 732,822, May 29, 1968, abandoned. This application July 22, 1971, Ser. No. 165,348
Int. Cl. C07d 33/50, 35/34
U.S. Cl. 260—283 CN 4 Claims

New chemical compositions of the formula



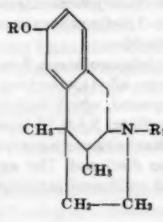
wherein each R is selected from the group consisting of hydrogen and alkyl; A forms a substituted or unsubstituted hydrocarbon ring of six carbon atoms wherein the substituents are selected from the group consisting of alkyl, alkenyl, halogen, haloalkyl, alkoxy, nitro, and dialkylamino; m is an integer from 1 to 3; n is an integer from 0 to 1; and $m+n$ is an integer from 2 to 3. A fungicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to fungi, a compound of the above description. A method for the control of fungi which comprises applying to said fungi a fungicidal composition comprising an inert carrier and, in a quantity toxic to fungi a compound heretofore described.

3,723,440
DERIVATIVES OF 6,7-BENZOMORPHAN

Kurt Freter, and Karl Zeile, both of Ingelheim am Rhine, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhine, Germany

Filed Oct. 12, 1960, Ser. No. 62,099
Claims priority, application Germany, Oct. 16, 1959, B 55 207
Int. Cl. C07d 39/00
U.S. Cl. 260—293.54 7 Claims

A benzomorphan selected from the compounds of the formula



wherein R is hydrogen or acyl and R is a saturated or saturated acyclic hydrocarbon radical with three carbon atoms and their non-toxic, pharmacologically acceptable acid addition and quaternary salts exhibit strong analgesic activities without the undesirable side effects of morphine.

3,723,441
BENZOHETEROCYCLICALKYL DERIVATIVES OF 1-PHENYL-1,3,8, TRIAZASPIRO (4,5) DECAN-4-ONE

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Philadelphia, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Division of Ser. No. 771,320, Oct. 28, 1968, Pat. No. 3,629,267. This application March 11, 1971, Ser. No. 123,442
Int. Cl. C07d 63/18
U.S. Cl. 260—293.57 5 Claims

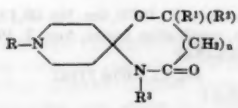
Benzoheterocyclic-alkyl derivatives of 1-phenyl-1,3,8-triazaspiro[4,5]decan-4-one in which the benzoheterocyclic moiety is thianaphthenyl or benzofuranyl, optionally substituted by chloro, bromo, fluoro, methyl, methoxy or trifluoromethyl, have neuroleptic activity. The compounds are generally prepared from either the benzo-heterocyclicalkyl halide by reaction with the appropriate amine or the benzoheterocyclic amine by condensation with a 5,5-bis (β-haloethyl) barbituric acid.

3,723,442
3-OXO-1-OXA-4,8-DIAZASPIRO(4.5)DECANES

Michio Nakanishi, Oita; Katsuo Arimura, Fukuoka, and Hideki Ao, Oita, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

Filed Dec. 31, 1970, Ser. No. 103,322
Int. Cl. C07d 99/02
U.S. Cl. 260—293.66 7 Claims

3-oxo-1-oxa-4,8-diazaspiro[4.5]decanes having the general formula



wherein R, R^1, R^2, R^3 and n are defined hereinafter, their pharmaceutically acceptable acid addition salts thereof and methods for the preparation of said compounds are disclosed. The compounds are used as agents having strong reserpine antagonistic activity and agents for lowering the blood sugar level.

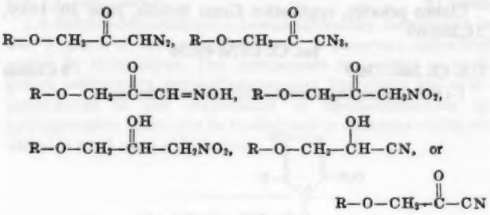
3,723,443
4-(3-SUBSTITUTED AMINO)-2-HYDROXYPROPOXY)-1,2,5-THIADIAZOLES

Burton Kendall Wasson, Valois, Quebec, Canada, assignor to Charles E. Frosst & Co., Kirkland, Quebec, China /Taiwan

Division of Ser. No. 818,090, April 21, 1969, Pat. No. 3,655,663, which is a continuation-in-part of Ser. No. 731,333, May 22, 1968, abandoned. This application Sept. 9, 1971, Ser. No. 179,147
Int. Cl. C07d 91/68
U.S. Cl. 260—293.68 8 Claims

4-[3-(Substituted amino)-2-hydroxypropoxyl]-1,2,5-thiadiazole compounds, substituted by a nitrogen containing group in the 3-position of the thiadiazole nucleus which exhibit β-adrenergic blocking properties and thus are useful in the management of angina pectoris are described. The products are prepared by one of three principal methods (1) reaction of a 4-hydroxy-1,2,5-thiadiazole with epihalohydrin to provide 4-(3-halo-2-hydroxypropoxy)-1,2,5-thiadiazole which, upon treatment with alkali, forms the epoxide which is then reacted with an amine to provide the desired product; (2)

reaction of a 3-chloro(or bromo)-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole with an amine or an N-containing heterocycle that replaces the 3-chloro group; and (3) reductive alkylation of an



wherein R is the 1,2,5-thiadiazole-4-yl group.

3,723,444

MANUFACTURING OF BIPYRIDYLIUM SALTS

John Edward Colchester, and Thomas Blundell, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 16, 1969, Ser. No. 833,710
Claims priority, application Great Britain, July 1, 1968, 31,366/68
Int. Cl. C07d 31/22
U.S. Cl. 260—295 AM 34 Claims

A process for the manufacture of a 1,1'-disubstituted-4,4'-bipyridylium salt which comprises reacting an N-substituted-4-cyano pyridinium salt with ammonia or an alkali metal hydroxide and subsequently oxidizing the resulting interaction product.

3,723,445

PROCESS FOR THE PREPARATION OF [3-(4-PHENYL)-1-(2H)-3,6-DIHYDRO-PYRIDYL]-PROPOXY OR PROPYLTHIO-ANILIDES OR DERIVATIVES THEREOF

Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed June 14, 1971, Ser. No. 152,979
Claims priority, application Switzerland, June 17, 1970, 9145/70
Int. Cl. C07d 31/44
U.S. Cl. 260—295 AM 9 Claims

A process of preparing aromatic ethers comprising subjecting an appropriately substituted oxazine to acidic rearrangement is described. The end products are useful as antiphlogistic, antiallergic, antitussive and analgesic agents.

3,723,446

αHALOPENOXY-ISOBUTYROYL-β-NICOTINOYL-GLYCOLS AND PROCESSES THEREFOR

Arthur Scherm, Bad Homburg v.d.H., and Dezso Peteri, Frankfurt/Main, both of Germany, assignors to Merz & Co. Chemische Fabrik, Frankfurt-am-Main, Germany

Filed Aug. 12, 1970, Ser. No. 63,344
Claims priority, application Germany, Aug. 13, 1969, P 19 41 217.0
Int. Cl. C07d 31/36
U.S. Cl. 260—295.5 R 2 Claims

α-Halophenoxy-isobutyroyl-β-nicotinoyl glycols are prepared by esterifying halophenoxy-isobutyric acid with ethylene glycol and then further reacting the obtained semi-ester with a nicotinic acid halide. The prepared compounds are useful as lipid-lowering agents.

3,723,447

BENZOTHIAZOLE CERTAIN ETHERS AND AMINES OF 1,2,3-BENZOTHIAZOLE

John D. Diekman, Mountain View, and John B. Siddall, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed April 5, 1971, Ser. No. 131,454
Int. Cl. C07d 91/56
U.S. Cl. 260—304 27 Claims

Ethers and amines of 1,2,3-benzothiadiazole prepared by alkylation of hydroxy-1,2,3-benzothiadiazole and amino-1,2,3-benzothiadiazole useful for the control of insects.

3,723,448

N-(4-CYANO-1,2,3-THIADIZOL-5-YL) PROPIONAMIDE

Gert Paul Volpp, Princeton, and Harry Dounchis, Lawrence Township, both of N.J., assignors to TMC Coporation, New York, N.Y.

Filed June 29, 1971, Ser. No. 158,117
Int. Cl. C07d 91/54
U.S. Cl. 260—306.8 D 1 Claim

A new chemical compound, of the formula N-(4-cyano-1,2,3-thiadiazol-5-yl)propionamide, has selective pre-emergence and post-emergence herbicidal activity. The synthesis of this compound is described, and its utility is exemplified.

3,723,449

CERTAIN FLUOROESCENT 2-(2-HYDROXY-PHTHALIMIDOMETHYL-PHENYL)-BENZOTHIAZOLES

Joseph G. Wirth, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 30, 1971, Ser. No. 167,838
Int. Cl. C07d 99/10, 91/44
U.S. Cl. 260—304 5 Claims

Compared to the parent compound, phthalimidomethyl derivatives of 2-(2-hydroxyphenyl)benzothiazole have much lower vapor pressure and greatly improved ultraviolet stability. Both of these factors make these derivatives much better organic phosphors than the parent compound since they have greatly improved the useful lifetime of compositions where they have been incorporated to impart fluorescent properties. These new derivatives fluoresce with a yellow color.

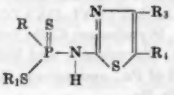
3,723,450

PHOSPHONAMIDO THIAZOLES AND THEIR UTILITY AS INSECTICIDES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 29, 1971, Ser. No. 198,012
Int. Cl. C07d 91/34
U.S. Cl. 260—306.8 R 35 Claims

Compounds of the formula

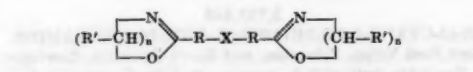


in which R is alkyl; R_1 is alkyl, alkenyl, alkynyl, benzyl, cyanoalkyl or alkylthioalkylene; R_3 is hydrogen or alkyl; R_4 is hydrogen, alkyl or alkylthioalkylene and the use of these compounds as insecticides and acaricides.

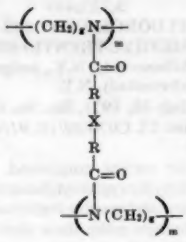
3,723,451
B1-2-OXAZOLINE AND OXAZINE ETHERS AND THIOETHERS

Donald A. Tomalia, and Janet N. Paige, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

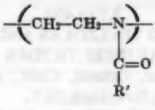
Division of Ser. No. 834,611, June 16, 1969, Pat. No. 3,563,920. This application Sept. 29, 1970, Ser. No. 76,598
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F 5 Claims



Wherein R is alkylene, phenylene, vinylene, or phenylene-alkylene, wherein, "alkylene" alone or in a combined name, designates an alkylene moiety that is of from one to 10 carbon atoms, and X is —S— or —O—; *n* is zero or 1; optionally also with an oxazoline as comonomer, are cationically polymerized to polymers containing recurring units of the formula



and, optionally, also units of the formula



wherein *g* is an integer 2 or 3, *m* represents the degree of polymerization, and R′ is hydrogen or a specified radical.

3,723,452
2-HALOPHENYL-4,4-DIALKYL-5-HALO-5-DIHALOMETHYL-OXAZOLINES

Patrick J. McNulty, Wyndmoor; Colin Swithenbank, Perkasie; Kenneth L. Viste, Warminster, and William C. Von Meyer, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 829,084, May 29, 1969, Pat. No. 3,661,991. This application April 19, 1971, Ser. No. 135,471
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 F 5 Claims

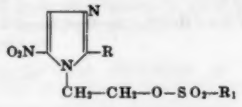
Compounds belonging to the class of 2-(mono, di or trisubstituted phenyl)-4,4-dimethyl (or ethyl) -5-bromo (or chloro)-5-dibromo (or dichloro) methyl oxazolines and their hydrohalide salts. These compounds are fungicides.

3,723,453
1-(BETA-SULPHONYLOXY-ETHYL)-IMIDAZOLES

Boris Gradnik; Andrea Pedrazzoli, both of Milan, and Leone Dall'Asta, Pavia, all of Italy, assignors to Societe D'Etudes de Recherches et D'Applications Scientifigues et Medicales E.R.A.S.M.E., Paris, France

Filed June 17, 1970, Ser. No. 47,142
Claims priority, application Great Britain, June 20, 1969, 31,266/69
Int. Cl. C07d *49/36*
U.S. Cl. 260—309 9 Claims

1-(β-Sulphonyloxy-ethyl)-imidazoles of formula



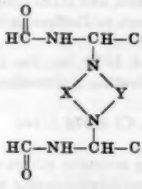
where R is hydrogen or lower alkyl and R_1 is an alkyl radical, a cycloalkyl radical, a substituted or unsubstituted benzyl or phenyl radical; or a tetrahydrofurfuryl radical and their pharmaceutically acceptable acid addition salts show activity against a large variety of bacteria, mycetes, pathogenic moulds and protozoa and also show a good cytostatic action vitro. They are prepared by reacting the sodium salt of a corresponding free imidazole with a sulphonyloxy-ethyl halide or a corresponding 1-(β-hydroxy-ethyl)-imidazole with a sulphonyl chloride.

3,723,454
N,N′-BIS-[(1′-FORMAMIDO-2′,2′,2′-TRICHLORO)-ETHYL]-IMIDAZOLIDINES

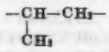
Walter Ost, and Klaus Thomas, both of Ingelheim am Rhein, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Germany

Filed April 19, 1971, Ser. No. 135,415
Claims priority, application Germany, April 24, 1970, P 20 19 844.1
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 3 Claims

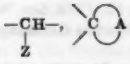
Compounds of the formula



wherein X is —$(CH_2)_2$—, —$(CH_2)_3$— or



and Y is



or, when X is —$(CH_2)_2$—, also —$(CH_2)_3$—;
where Z is hydrogen, phenyl, chlorophenyl, 2-furyl or 2-pyridyl; and A is tetramethylene or pentamethylene, each optionally having from 1 to 3 (alkyl of 1 to 4 carbon atoms)-substituents attached thereto,
the compounds are useful as agricultural fungicides.

3,723,455

PREPARATION OF 1,4-SUBSTITUTED-IMIDAZOLIN-2-ONES

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed April 22, 1971, Ser. No. 136,611
Int. Cl. C07d 49/34
U.S. Cl. 260—309.6 9 Claims

1,4-Substituted-imidazolin-2-ones optionally substituted in the 5 position are prepared from N-propenyl-carbamoyl azides by thermolysis. The compounds are useful as analgesics, antipyretics, anti-inflammatories, herbicides and as intermediates in the preparation of imidazolidinones by hydrogenation which can be hydrolyzed to diamines which are useful in producing polyamides.

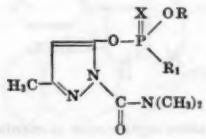
3,723,456

PYRAZOLO-(THIONO)PHOSPHORIC(PHOSPHONIC) ACID ESTERS

Christa Fest, Wuppertal-Elberfeld, and Ingeborg Hammann, Cologne, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 1, 1971, Ser. No. 185,811
Claims priority, application Germany, Oct. 9, 1970, P 20 49 692.8
Int. Cl. C07f 9/08, 9/16, 9/40
U.S. Cl. 260—310 R 7 Claims

Pyrazolo-(thiono)phosphoric(phosphonic) acid esters of the general formula



(I)

in which

R is an alkyl radical with one to six carbon atoms,

R_1 is an alkyl or alkoxy radical with one to six carbon atoms or a phenyl radical, and

X is oxygen or sulfur,

which possess insecticidal, acaricidal and rodenticidal properties.

3,723,457

INDOLINE-2-ONE DERIVATIVES AND PREPARATION THEREOF

Noriysu Hirose, and Shigeru Souda, both of Tokyo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 74,164
Claims priority, application Japan, Sept. 30, 1969, 44/77438; Sept. 30, 1969, 44/77439; Sept. 30, 1969, 44/77440; Sept. 30, 1969, 44/77441
Int. Cl. C07d 27/40
U.S. Cl. 260—325 6 Claims

Indoline-2-one derivatives, more particularly, 1-benzyl-3-substituted or unsubstituted-aminomethyl-3-hydroxy-indoline-2-one derivatives and their pharmacologically acceptable salts as well as the methods for synthesis thereof. The compounds are new and possess strong analgesic and anti-inflammatory activities with low toxicity and accordingly they are useful for therapeutic purposes.

3,723,458

(1-ALKOXYVINYL)2-OXO-3-INDOLINE ACETATES

Janis Plostnieks, Phila, Pa., assignor to McNeil Laboratories, Inc.

Division of Ser. No. 799,948, Feb. 17, 1969, Pat. No. 3,577,430, which is a continuation-in-part of Ser. No. 642,685, June 1, 1967, abandoned, which is a continuation-in-part of Ser. No. 553,034, May 26, 1966, abandoned. This application Dec. 21, 1970, Ser. No. 100,525
Int. Cl. C07d 27/40
U.S. Cl. 260—325 2 Claims

The compounds are of the class of 2-oxindole acetamides useful as ultra-violet light absorbers and having central nervous system depressant activity; and of the class of 2-oxo-3-indoline acetate esters useful as intermediates in the preparation of said acetamides.

3,723,459

2-OXOSPIRO (INDOLINE -3,4'-THIOCHROMAN) DERIVATIVES

Vasken Paragamian, Dresher, Pa., assignor to McNeil Laboratories, Inc., Fort Washington, Pa.

Filed April 23, 1971, Ser. No. 137,043
Int. Cl. C07d 27/40
U.S. Cl. 260—325 7 Claims

6,7-Dihydro-12H[1]benzothiepino-[5,4-b]indole-5-oxides are utilized as precursors for making certain 2-oxospiro[indoline-3,4'-thiochroman] derivatives, of which the ester and nitrile derivatives are useful as inhibitors of gastric acid secretion and the acid derivatives are useful as precursors for making the ester derivatives.

3,723,460

POLYMERIC SUCCINIMIDES AND THEIR DERIVATIVES AS FUEL AND MOTOR OIL ADDITIVES

William T. Brannen, West Lake, Ohio, and Roger W. Watson, Highland, Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 10, 1969, Ser. No. 865,497
Int. Cl. C07d 27/10
U.S. Cl. 260—326.5 F 1 Claim

The disclosure describes reaction products useful as multipurpose fuel and motor oil additives which are reaction products of about equal molar portions of (1) an intermediate product produced by the condensation reaction between about equal molar portions of a compound selected from the group consisting of an alkenyl substituted succinic acid, an alkenyl substituted succinic anhydride and an alkenyl substituted succinimide or metal salt thereof, said compound having an average molecular weight from about 350 to about 1,000, and a second compound selected from the group consisting of ammonia gas, ammonium hydroxide and hydrazine, and (2) a third compound selected from the group consisting of basic metal compounds, compounds with displaceable halogens, acid halides, alkylene oxides, acid anhydrides, thio anhydrides, triethyl phosphite, boric acid and acrylonitrile. The intermediate product was itself found to be useful as a fuel and motor oil additive.

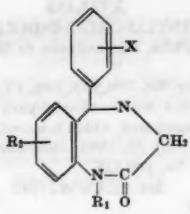
3,723,461

2-AMINOMETHYL-3-HALOPLENYLINDOLES

Hisao Yamamoto; Shigeho Inaba, both of Nishinomiya; Tadashi Okamoto, Ashiya; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo; Michihiro Yamamoto, Takarazuka; Isami Maruyama, Minoo; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Higashi-ku, Osaka, Japan

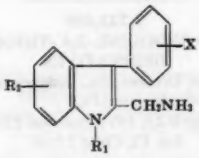
Division of Ser. No. 762,341, Sept. 16, 1968. This application Nov. 6, 1970, Ser. No. 87,613
Claims priority, application Japan, Sept. 22, 1967, 42/60952
Int. Cl. C07d 27/56
U.S. Cl. 260—326.15 3 Claims

The process for producing benzodiazepine derivatives useful for tranquilizer,



wherein R_1 is hydrogen, C_1~C_3 alkyl group or C_4~C_7 cyclohexylmethyl group and R_2 is hydrogen or halogens and X is halogens

2-Amino-methylindole derivatives or their salts



wherein R_1, R_2 and X respectively have the same meanings as above is allowed to react with an appropriate oxidizing agent, such as for example, chromium trioxide.

3,723,462

EPITHIO DIENOATES

John B. Siddall, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Feb. 1, 1971, Ser. No. 111,674

Int. Cl. C07d *59/00*

U.S. Cl. 260—327 E **14 Claims**

Novel epithio substituted hydro-carbon esters, derivatives thereof, and amides having diunsaturation, synthesis thereof, useful for the control of insects.

3,723,463

DIBENZOOXAZEPINES AND DIBENZOTHIAZEPINES

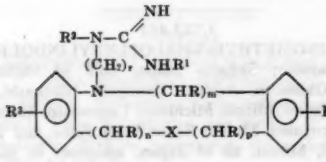
Harry L. Yale, and Jack Bernstein, both of New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Division of Ser. No. 17,972, March 9, 1970, Pat. No. 3,657,275, which is a continuation-in-part of Ser. No. 551,560, May 20, 1966, abandoned. This application Aug. 17, 1971, Ser. No. 172,570

Int. Cl. C07d *93/42*, *93/44*

U.S. Cl. 260—327 B **11 Claims**

Therapeutically active compounds utilizable as ataractic agents and as sedatives and hypotensive agents having the formula



wherein R, R^1 and R^2 are hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R^3 and R^4 are hydrogen, halogen, lower alkyl, trifluoromethyl, or lower alkoxy; X is oxygen or sulfur, *r* is 2 to 5; *m* is 0 or 1; *n* and *p* are each 0, 1 or 2; provided that the sum of $m+n+p$ being from 1 to 3, and that when *m* equals 1 and *n* and *p* are each O, X is sulfur.

3,723,464

PROCESS FOR MANUFACTURING NITROBENZODIAZEPINE DERIVATIVES

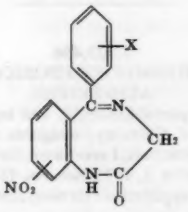
Hisao Yamamoto, Nishinomiya; Shigeho Inaba, Takarazuka; Tadashi Okamoto, Ashiya; Toshiyuki Hirohashi, Kobe; Kikuo Ishizumi, Minoo; Michihiro Yamamoto, Takarazuka; Isamu Maruyama, Minoo; Kazuo Mori, Kobe, and Tsuyoshi Kobayashi, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 770,815, Oct. 25, 1968, Pat. No. 3,658,809. This application April 6, 1971, Ser. No. 131,767

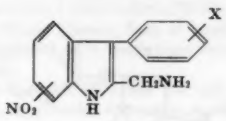
Int. Cl. C07d *27/56*

U.S. Cl. 260—326.15 **1 Claim**

Benzodiazepine derivatives, which have been well known as excellent tranquillizers and which have the formula,

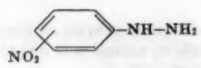


wherein X signifies a hydrogen or halogen atom, are obtained by reacting with an oxidizing agent, such as chromic acid or the like, a novel 2-aminomethylindole derivative of the formula,

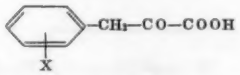


wherein X has the same significance as mentioned above.

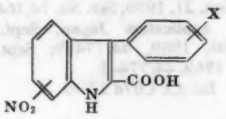
The starting 2-aminomethylindole derivatives are prepared by reacting a nitrophenylhydrazine of the formula,



with a phenylpyruvic acid derivative of the formula,



wherein X has the same significance as mentioned above, to give an indole 2-carboxylic acid derivative of the formula,



wherein X has the same significance as mentioned above, converting the indole-2-carboxylic acid derivative to a corresponding amide derivative, dehydrating the amide to a corresponding nitrile derivative, and then reducing the formed nitrile derivatives.

3,723,465

DIBENZOPYRANS, THEIR ISOMERIC FLUORENOLS AND IBENZOTHIOPYRANS

Walter L. Hall, Mount Vernon, Ind., and Jimmy L. Webb, Jonesville, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 26, 1971, Ser. No. 147,164
Int. Cl. C07c *39/12*; C07d *65/16*, *7/42*
U.S. Cl. 260—328 14 Claims

In a very strongly acidic liquid media, 2,6-diphenylphenol and 2,6-diphenylthiophenol react with most aldehydes and ketones to produce dibenzopyrans or dibenzothiopyrans. The dibenzopyrans, but not the dibenzothiopyrans, can be isomerized to their corresponding fluorenols. Both the pyran and thiopyran ring can be cleaved to convert these materials into phenols which differ from starting phenols because one of the o-phenyl substituents, itself, now has an ortho substituent characteristic of the aldehyde or ketone reactant. Both these phenols and the fluorenols, being phenolic compounds are useful as antioxidants, stabilizers, etc.

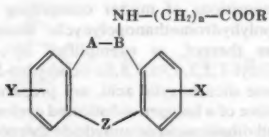
3,723,466

TRICYCLIC COMPOUNDS

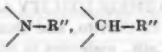
Charles Malen, Fresnes; Monique Desnos, Issy les Moulineaux, and Jean-Claude Poignant, Wissous, all of France, assignors to Societe en nom Collectif "Science Union et Cie, Societe Francaise de Recherche Medicale,", Suresne, France

Filed June 22, 1970, Ser. No. 48,498
Claims priority, application Great Britain, June 20, 1969, 31,285/69
Int. Cl. C07d *87/54*
U.S. Cl. 260—333 6 Claims

Tricyclic compounds of the formula :



wherein *n* is an integer from 1 to 11 inclusive ; R is hydrogen or lower alkyl ; X and Y are hydrogen, halogen, lower alkyl , lower alkoxy, lower alkylthio, lower alkylsulfonyl, trifluoromethyl, nitro or cyano ; Z is —O—, —S—, —SO—, $-SO_2-$



—CO—, or

wherein R″ is hydrogen or lower alkyl ; and A—B is

or

wherein R‴ is hydrogen or lower alkyl.

These compounds possess central nervous system acting properties.

3,723,467

SESAMOLYL ETHERS AND THIOETHERS

John B. Siddall, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 12, 1970, Ser. No. 89,022
Int. Cl. C07d *13/10*
U.S. Cl. 260—340.5 11 Claims

Novel ethers, thioethers and amines having an oxo-substituted chain and the ketal thereof for the control of insects.

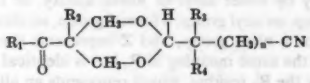
3,723,468

KETONITRILES AND METHOD FOR THEIR PRODUCTION

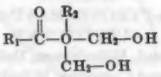
Georg Blumenfeld, Troisdorf-Siegler; Gerhard Daum, Cologne-Raderberg, and Hermann Richtzenhain, Schwellbach, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Jan. 28, 1970, Ser. No. 6,575
Claims priority, application Germany, Feb. 4, 1969, P 19 05 258.5
Int. Cl. C07d *15/02*
U.S. Cl. 260—340.7 3 Claims

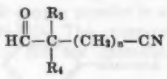
Ketonitriles of the general formula



in which R_1 and R_2 signify alkyl groups with one to four carbon-atoms, R_3 and R_4 are hydrogen atoms or alkyl groups with one to four C-atoms and wherein R_3 and R_4 may also together form a carbocyclic ring preferably with five or six C-atoms and *n* is zero, 1 or 2 produced by condensing diols of the formula



with cyanaldehydes of the formula



wherein R_1, R_2, R_3, R_4 and *n* have the same meanings as set forth above, in the presence of strong acid catalysts where the diols may be in the thickly liquid, impure form. These ketonitriles are useful as herbicides.

3,723,469

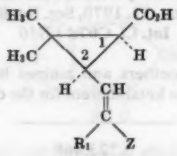
PROCESS FOR THE PREPARATION OF CYCLOPROPANE DERIVATIVES AND COMPOUNDS PRODUCED THEREIN

Jacques Martel, Bondy, France, assignor to Roussel UCLAF, Paris, France

Filed July 11, 1969, Ser. No. 841,140
Claims priority, application France, July 12, 1968, 68159066; July 12, 1968, 68159067
Int. Cl. C07d *5/34*
U.S. Cl. 260—343.3 19 Claims

Process for the preparation of an internal hemiacylal of racemic or optically active cis 3,3-dimethyl-2-formyl-

cyclopropane-1-carboxylic acid which are intermediates for the preparation of racemic or optically-active cyclopropane carboxylic acid of the formula



I

wherein the CO_2H substituent on the carbon 1 and the

substituent on the carbon 2 are in the cis-position relative to one another, R_1 represents a hydrogen, an alkyl radical, an aralkyl radical, an aryl radical, an alkenyl radical, an alkynyl radical, a cycloalkyl radical, a cycloalkenyl radical, a heterocyclic radical, these radicals being able to be substituted, specifically by lower alkyl or lower alkoxy, or represents a cyano group, an acyl group, a formyl group, an alkoxy-carbonyl group or a nitro group, and Z represents the R_2 residue which has the same meaning as R_1 but is identical or different thereto, or the R_3 residue, which represents an allyl radical, a benzyl radical, a cyano group, an acyl group, a formyl group, an alkoxycarbonyl group, or a nitro group, or R_1 and Z together form a saturated or unsaturated carbon homocycle or heterocycle, whose ring can support substituents such as lower alkyls or lower alkoxys, or functions such as ketonic functions, or together form a polycyclic aromatic residue such as a fluorene residue.

3,723,470

3,4-DIFLUORO-α-PYRONES HAVING A 6-AROMATIC SUBSTITUENT

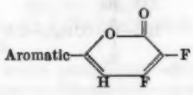
David Charles England, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1970, Ser. No. 68,495

Int. Cl. C07d 7/16

U.S. Cl. 260—343.5 **16 Claims**

Disclosed herein are pyrones of the formula



wherein the aromatic radical has six to 12 ring carbons, is attached by nuclear carbon to the 6-position and has up to five halogen, nitro, halo-lower alkyl, lower alkyl, or lower alkoxy substituents. Also disclosed is a process for making the compounds and their usefulness in inhibiting both yeast and mold fungi.

3,723,471

NOVEL BENZOPYRAN DERIVATIVES

Ulrich Eder, and Gerhard Sauer, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

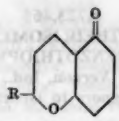
Filed Feb. 4, 1971, Ser. No. 112,764

Claims priority, application Germany, Feb. 6, 1970, P 20 06 372.3

Int. Cl. C07d 7/20

U.S. Cl. 260—345.2 **8 Claims**

Benzopyrans of the formula



wherein R is lower-alkyl are useful as intermediates in the production of steroids, e.g., 4,9(10)-estradiene-3,17-dione.

3,723,472

SYNTHESIS OF 2,2-DIMETHYL-7-BENZOFURANOL

John F. Start, and Donald L. Towns, both of Trenton, N.J., assignors to FMC Corporation, New York, N.Y.

Filed Nov. 27, 1970, Ser. No. 93,289

Int. Cl. C07d 5/36

U.S. Cl. 260—346.2 R **5 Claims**

The hydrolysis of 2,3-dihydro-2,2-dimethylbenzofuran-7-diazonium bisulfate to produce 2,3-dihyro-2,2-dimethyl-7-benzofuranol is carried out in the presence of a catalytic amount of a cuprous compound. The cuprous compound accelerates hydrolysis of the diazonium salt with concomitant reduction of tarry by-products.

3,723,473

9-BENZYL OR 9-HALOBENZYL-PENTA HALO-OCTAHYDRO-5,8-METHANONAPHTHALENE-2,3-DICARBOXYLIC ACID OR ANHYDRIDE

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 2, 1970, Ser. No. 7,998

Int. Cl. C07c 61/28

U.S. Cl. 260—346.6 **4 Claims**

Novel compositions of matter comprising polyhalo-substituted arylpolyhydromethanopolycyclic dicarboxylic acids or anhydrides thereof, as exemplified by 5,6,7,8,9-pentachloro-9-benzyl-1,2,3,4,4a,5,8,8a-octahydro-5,8-methano-2,3-naphthalene dicarboxylic acid, are prepared by reacting an aryl derivative of a halogen-substituted cycloalkadiene with an unsaturated dibasic acid or anhydride thereof. These novel compositions of matter are useful as components of finished plastic compounds, the novel compositions of matter imparting flame retardant properties to the finished compound.

3,723,474

META-THIOCARBAMYL PHENYLENE AMIDES AND UREAS AND THEIR UTILITY AS HERBICIDES

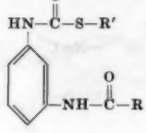
Eugene G. Teach, El Cerrito, and Duane R. Arneklev, Sunnyvale, both of Calif., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,379

Int. Cl. C07d 5/16; C07c 153/07

U.S. Cl. 260—347.2 **30 Claims**

Meta-thiocarbamyl phenylene amides and ureas having the formula



in which R′ is alkyl or benzyl and R is alkyl, monoalkylamino, N,N-di-substituted amino wherein said substituents are independently selected from the group consisting of alkyl, alkoxy, furfuryl and cycloalkenyl. The compounds of this invention are useful as herbicides.

3,723,475

METHOD OF MAKING 2-ALKYLFURAN-3-THIOL AND ALKYL, (2-ALKYL-3-FURYL) DI AND TRISULFIDES

William John Evers, Altantic Highlands, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 864,227, Oct. 6, 1969, which is a continuation-in-part of Ser. No. 796,923, Feb. 5, 1969, Pat. No. 3,666,495. This application Sept. 13, 1971, Ser. No. 180,201

Int. Cl. C07d 5/16

U.S. Cl. 260—347.2 2 Claims

Novel 3-sulfur derivatives of furan including alkyl furan-3-thiols and bis(alkyl-3-furyl) sulfides and di- and tetrahydro derivatives thereof having meaty and/or roasted aromas and flavors; processes for producing such 3-sulfur derivatives; novel flavoring compositions containing such derivatives; and novel food compositions containing such derivatives.

3,723,476

1-HYDROCARBYLAMINO-3-(ORTHO-FURYLMETHYLOXYPHENOXY OR TETRAHYDROFURYLMETHYLOXY-PHENOXY)-2-PROPANOL COMPOUNDS

Michio Nakanishi; Tomio Muro, both of Oita; Hiroshi Imamura, Chiba, and Nobuharu Yamaguchi, Kanagawa, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

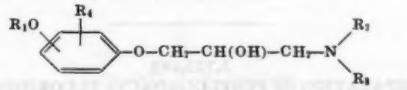
Filed May 15, 1970, Ser. No. 37,895

Claims priority, application Japan, May 16, 1969, 44/38137; April 3, 1970, 45/28945; April 3, 1970, 45/28946; Oct. 2, 1969, 44/79477

Int. Cl. C07d 5/16, 5/20

U.S. Cl. 260—347.7 10 Claims

Phenoxy-aminopropanol derivatives of the formula



wherein R_1 is furylmethyl, thienylmethyl, tetrahydrofurylmethyl, pyridylmethyl, or a group of the formula R—X—A—, wherein R is C_{1-4} alkyl, C_{1-4} alkenyl, phenyl or benzyl, X is —O— or —S—, and A is C_{1-4} alkylene or $—CH_2C \equiv CCH_2—$; $—N(R_2)(R_3)$ is C_{1-4} alkylamino, dialkylamino (each alkyl being at most four carbon atoms), cyclohexylamino, piperidino, morpholino or 4-methyl-1-piperazinyl; and R_4 is H, CH_3 or Cl, and pharmaceutically acceptable acid addition salts thereof, are useful as β-adrenergic blocking agents.

3,723,477

4-FLUORO-3-METHYLPHENYL 5-NITRO-2-FURYL KETONE

Stanford S. Pelosi, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc.

Filed May 15, 1970, Ser. No. 37,923

Int. Cl. C07d 5/30

U.S. Cl. 260—347.8 1 Claim

4-Fluoro-3-methylphenyl 5-nitro-2-furyl ketone is a potent anti-fungal agent.

3,723,478

MONOEPOXIDIZED PRODUCTS OF DODECATRIENE

Gunther Ohloff, and Karl Heinrich Schulte Elte, both of Geneva, Switzerland, assignors to Firmenich & Cie, Geneva, Switzerland

Filed May 10, 1966, Ser. No. 549,172

Claims priority, application Switzerland, May 11, 1965, 6538/65

Int. Cl. C07d 1/00, 1/06

U.S. Cl. 260—348 C 3 Claims

Mixtures of isomeric monoepoxides of trimethylcyclododecatrienes prepared by monoepoxidizing a mixture of 3,4,8- and 4,8,12-trimethyl-1,5,9-cyclododecatrienes or a mixture of 1,5,9- and 2,5,9-trimethyl-1,5,9-cyclododecatrienes possess valuable odoriferous properties and also have a fixative effect in mixtures with other odoriferous substances. Certain ketones and lactones derivable from the monoepoxides are also described; these also have useful odoriferous characteristics.

3,723,479

2,2'-DIACYLAMINO-1,1'-DIANTHRAQUINONYLS

Alfred Schuhmacher, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

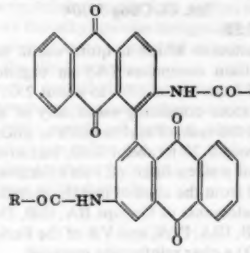
Filed Aug. 26, 1970, Ser. No. 67,226

Claims priority, application Germany, Sept. 1, 1969, P 19 44 276.3; Nov. 3, 1969, P 19 55 157.6

Int. Cl. C09b 1/40, 1/42

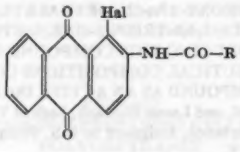
U.S. Cl. 260—368 5 Claims

2,2'-diacylamino-1,1'-dianthraquinonyls having the general formula:



(I)

in which R denotes alkyl having one to six carbon atoms or substituted or unsubstituted aryl and to a method for the production of the compounds (I). The compounds (I) may be prepared by reaction of 1-halo-2-acylaminoanthraquinones having the formula:



(II)

in which R has the above meanings and Hal denotes a chlorine or bromine atom with copper powder in a solvent which contains the grouping -N-CO-. The compounds (I) represent a valuable intermediate for the manufacture of dyes, e.g. flavanthrene.

3,723,480

ANTRAQUINONE DYESTUFFS

Gehrke Gunter; Volker Hederich, both of Cologne; Wolfgang Harms, Leverkusen, and Peter Wegner, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft

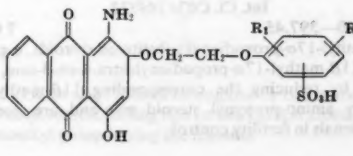
Filed July 8, 1970, Ser. No. 53,282

Claims priority, application Germany, July 17, 1969, P 19 36 400.2

Int. Cl. C09b 1/52

U.S. Cl. 260—373 7 Claims

Anthraquinone dyestuffs of the formula



in which R_1 and R_2, independently of one another, stand for hydrogen, straight-chain or branched alkyl radicals with one to nine carbon atoms or chlorine atoms.

The new compounds are valuable dyestuffs for the dyeing of fibers of natural or synthetic polyamides. The brilliant red dyeings or prints exhibit excellent fastness to wet processing, very good fastness to light and outstanding fastness to thermofixing.

3,723,481

ABLATIVE COATING COMPOSITIONS

William J. Bobear, Latham, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 588,313, Oct. 21, 1966, abandoned, which is a continuation-in-part of Ser. No. 470,892, July 9, 1965, Pat. No. 3,506,607. This application Sept. 22, 1969, Ser. No. 860,121The portion of the term of this patent subsequent to April 14, 1987, has been disclaimed.

Int. Cl. C08g *51/04*

U.S. Cl. 260—37 SB **7 Claims**

A silicone elastomer which is quite useful as an ablative coating composition comprises (A) an organopolysiloxane having a ratio of from about 1.95 to about 2.01 organo radicals per silicon atom consisting essentially of alkyl and aryl radicals in which the ratio of aryl radicals to silicon can have a value of from about 0.20 to about 0.60, inclusive, (B) a reinforcing amount of a silica filler, (C) an effective amount of a member selected from the class of metals, metalloids and mixtures thereof of elements of Groups IIA, IIIB, IVB, VB, VIB, VIIB, VIII, IB, IIB, IIIA, IVA, and VA of the Periodic Table of Elements, and (D) a char reinforcing material.

3,723,482

17β-HYDROXY-17α-(2'-METHALLYL)9β, 10α-ANDROSTA-1,4,6-TRIEN-3-ONE, METHODS OF PRODUCING THIS COMPOUND AND PHARMACEUTICAL COMPOSITIONS COMPRISING SAID COMPOUND AS AN ACTIVE INGREDIENT

Pieter Westerhof, and Lucas Morsink, both of Van Houtenlaan, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 13, 1970, Ser. No. 54,616

Claims priority, application Great Britain, July 16, 1969, 35,861/69

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.4 **1 Claim**

A progestationally active 17α-(2'-methallyl)-9β, 10α-androsta-1,4,6-triene-3-one. 17β-hydroxy-17α-(2'-methallyl)9β, 10α-androsta-1,4,6-trien-3-one, methods of producing this compound and pharmaceutical compositions comprising said compound as an active ingredient.

3,723,483

11β-METHYL-17α-PROPADIENYL STEROIDS

Robert V. Coombs, 412 Morris Ave., Summit, N.J.

Filed July 27, 1970, Ser. No. 58,682

Int. Cl. C07c *169/22*

U.S. Cl. 260—397.45 **7 Claims**

11β-methyl-17α-propadienyl substituted steroids, e.g., 17β-hydroxy-11β-methyl-17α-propadienylestra-4-en-3-one, are prepared by reducing the corresponding 11β-methyl-17α-quaternary amino-propynyl steroid salt and are useful as progestationals in fertility control.

3,723,484

17-CHLORO STEROIDS

Henry Laurent; Rudolf Wiechert, and Karl Heinz Kolb, all of Berlin, Germany, assignors to Schering A.G., Berlin and Bergkamen, Germany

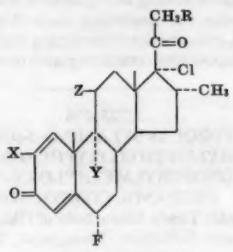
Filed Sept. 15, 1971, Ser. No. 180,898

Claims priority, application Germany, Sept. 18, 1970, P 20 47 105.0

Int. Cl. C07c *169/30*

U.S. Cl. 260—397.45 **18 Claims**

17-Chloro anti-inflammatory steroids of the formula



wherein X is H or Cl; Y is F or Cl; Z is OH, F or, when Y is Cl, Cl; and R is a free or esterified OH group, are produced by simultaneously reacting, in the presence of a sulfone, the corresponding 17-hydrogen compound or the corresponding $\Delta^{9(11)}$-17-hydrogen compound with hydrogen fluoride and with an N-chloroacylamide or N-chloroacylimide.

3,723,485

PREPARATION OF PERFLUOROACYL FLUORIDES AND PERFLUOROCARBOXYLIC ACIDS

Karl F. Thom, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 872,726, Oct. 30, 1969, Pat. No. 3,615,169. This application Feb. 20, 1970, Ser. No. 13,159. The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.

Int. Cl. C07c *61/18;* **C19c** *3/00*

U.S. Cl. 260—408 **4 Claims**

Pyrolysis of perfluoroalkanesulfonate salts of yttrium, scandium and rare earth metals in an inert atmosphere provides acyl fluorides when anhydrous salts are employed and carboxylic acids when the hydrated salts are employed. The acyl fluorides and carboxylic acids are useful intermediates known and used in the art.

3,723,486

PROCESS FOR PRODUCTION OF CARBOXYLIC ESTERS

Tsunesuke Kajimoto; Shigeru Wakamatsu; Ryoji Nakanishi; Michio Hara; Kiyotaka Ohno, and Jiro Tsuji, all of Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Oct. 21, 1971, Ser. No. 191,361

Int. Cl. C07c *67/00*

U.S. Cl. 260—410.9 R **3 Claims**

Process for carbonylation of olefinically unsaturated hydrocarbons to produce carboxylic esters by reaction in the presence of a palladium complex represented by the general formula

$$[PdCl_2(PPh_3)_2]_2(C_6H_4Cl_2)_x .$$

Carbon monoxide and alcohol are reacted with the olefinically unsaturated hydrocarbons.

3,723,487

PROCESS FOR EXTRACTING OIL FROM PALM FRUITS AND OLIVES

Raymond Arthur Couche, Ypres Rd., Kelmscott, Australia

Continuation-in-part of Ser. No. 592,631, Nov. 7, 1966, abandoned. This application July 14, 1970, Ser. No. 3,525

Int. Cl. C09f 5/02

U.S. Cl. 260—412.4 5 Claims

Multi-stage, counter-current process for extracting oil from palm fruit and olives, in which the fruit is disintegrated in the presence of the extraction solvent and passes through the successive stages meeting the extraction solvent in counter-current in such a manner that in each stage the slurry of solvent and solids is agitated, whereupon the solvent is separated from the solid material before being passed on for further extracting action.

The solvent used is either acetone, or a mixture of ethyl alcohol, ethyl acetate and acetone in the ratio of 1:1:1 by volume, or ethyl alcohol, ethyl acetate and isopropyl ether in the ratio of 4:2:1 by volume.

The temperature is maintained at 50° to 55°C throughout the extraction process, and the water:solvent ratio adjusted to 1:1 to 1:2 by weight in the first stage. The recovery of oil from the solvent occurs principally from the outgoing liquor of the first stage.

3,723,488

ETHYLENE-BIS-DITHIOCARBAMATO BIS-CHLOROSTANNANES

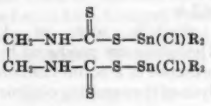
George A. Miller, Glenside, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 17, 1971, Ser. No. 181,562

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 5 Claims

Certain ethylene-bis-dithiocarbamato bis-chlorostannanes are fungicidal compounds having the formula:



where R is a hydrocarbyl group selected from the group consisting of N-alkyl of one to eight carbon atoms and phenyl.

3,723,489

METAL DERIVATIVES OF 3,5-DI-T-BUTYL-4-HYDROXYPHENYL PROPIONIC ACID

Martin Dexter, Briarcliff Manor; John D. Spivack, Spring Valley, and David H. Steinberg, Bronx, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 25, 1971, Ser. No. 118,969

Int. Cl. C07f 7/22

U.S. Cl. 260—429.7 4 Claims

The preparation of metal salts of alkylhydroxyphenylpropionic acid is described. The metal salts are useful as stabilizers of organic materials which are subject to thermal, oxidative and actinic deterioration.

A typical embodiment is manganese 3(3′,5′-di-t-butyl-4′-hydroxyphenyl)propionate.

3,723,490

PRODUCTION OF AZOMETHINE PIGMENTS

Eric Richard Inman, Bridge of Weir/Renfrewshire; Ian Alexander Macpherson, Paisley, Renfrewshire, and John Andrew Stirling, Glasgow, all of Scotland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 20, 1970, Ser. No. 39,164

Int. Cl. C07f 1/08

U.S. Cl. 260—438.1 4 Claims

Copper complexes of substituted bis-2-hydroxyphenylazomethines are prepared by reacting the products of salicylaldehydes and o-aminophenols with a coppering agent. Said compounds are pigments for organic material.

3,723,491

POLYSILOXANE-POLYALKYLENEGLYCOL BLOCK COPOLYMERS SUITABLE AS FOAM STABILIZERS IN THE MANUFACTURE OF POLYURETHANE FOAMS

Gerd Rossmy, Essen-Werden, and Gotz Koerner, Mulheim (Ruhr), both of Germany, assignors to The Goldschmidt A.G., Essen, Germany

Continuation-in-part of Ser. No. 687,459, Dec. 4, 1967, abandoned. This application Jan. 25, 1971, Ser. No. 109,699

Int. Cl. C07f 7/08, 7/18

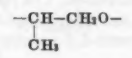
U.S. Cl. 260—448.2 B 15 Claims

Novel polysiloxane-polyalkyleneglycol block copolymers suitable as foam stabilizers in the preparation of flexible polyurethane foams. The novel block copolymers are characterized by the formula A B y, wherein

$$y \text{ is} = 1.75 \text{ to } 5;$$

A indicates the polysiloxane moiety of the block copolymer and being characterized by a mole weight of between about $250 \cdot y$ to $1000 \cdot y$, 1.9 to 2.02 alkyl and alkoxy groups on the average being associated with each silicon atom, the alkyl and alkoxy groups containing one to four carbon atoms, at least 90 mole percent of the alkyl groups being methyl and the alkoxy groups being present in an amount of at least 10 mole percent calculated on the alkyl groups;

B indicates the polyalkyleneglycol monoalkylether moiety or polyalkylene glycol monoarylether moiety which is characterized by a mole weight of between about 2400 to 5000, wherein the alkyl group has one to six carbon atoms and the polyalkyleneglycol residue is composed on the one hand of alkyleneoxy groups of the formula



and/or $-(CH_2)_4O-$ and, on the other hand, of the group $-(CH_2)_2O-$ in a weight ratio of about 50:50 to 70:30; and

wherein A and B are linked to each other by divalent groups being oxygen, alkylene of one to four carbon atoms, $-(CH_2)_2COO-$ or $-(CH_2)_3COO-$.

The application also discloses a process of preparing polyurethane foams, wherein the novel block copolymers are used as foam stabilizer.

3,723,492

PROCESS FOR PREPARING CELLULAR POLYURETHANES

Friedrich Moller, Leverkusen; Manfred Roegler, Bad Godesberg; Walter Simmler, Cologne, and Armand De Montigny, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

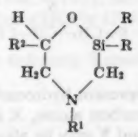
Filed June 28, 1971, Ser. No. 157,684

Claims priority, application Germany, June 30, 1970, P 20 32 186.2

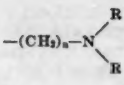
Int. Cl. C07f 7/18

U.S. Cl. 260—448.8 R 3 Claims

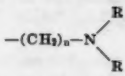
A method is provided for preparing cellular polyurethanes which comprises reacting in the presence of a blowing agent an organic polyisocyanate with a polyether or polyester containing at least two hydroxyl groups in the presence of a catalytic amount of a catalyst having the formula



in which R is an alkyl radical having one or two carbon atoms, R^1 is an alkyl radical having one or two carbon atoms or a dialkylaminoalkyl group having the formula

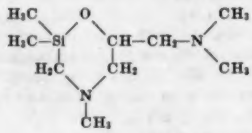


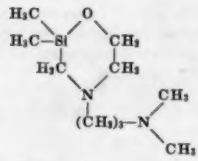
in which *n* is an integer of from one to three and *R* is an alkyl radical having one ro two carbon atoms, and R^2 is a dialkylaminoalkyl group having the formula

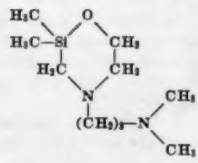


in which *n* is an integer of from one to three and *R* is an alkyl radical having one or two carbon atoms with the proviso that when R^1 is a dialkyl amino alkyl group, R^2 is hydrogen.

This invention also encompasses new silicon compounds having the formulas





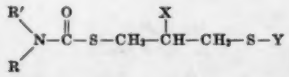


3,723,493
S-ACYL DERIVATIVES OF 3-MERCAPTO-2-CHLOROPROOPYL N,N-DIALKYLTHIOLCARBAMATES

William Carter Doyle, Jr., Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 851,432, Aug. 19, 1969, Pat. No. 3,628,945, which is a continuation-in-part of Ser. No. 625,603, March 24, 1967, Pat. No. 3,510,290. This application March 18, 1971, Ser. No. 125,799
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A 8 Claims

Undesired vegetation, particularly noxious grasses in growing crops, are combated by pre-emergent application of selective herbicides made by reacting an organic compound having a reactive halogen substituent with a 2,3-epithiopropyl N,N-dialkylthiolcarbamate to yield a compound of the structural formula



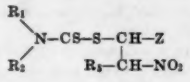
in which R and R′ represent hydrocarbon substituents containing less than 10 carbon atoms, X is halogen, preferably bromine or chlorine and Y may be alkanoyl, chloroalkanoyl, bromoalkanoyl, alkoxyalkanoyl, N,N-dialkylcarbamyl, carbalkoxycarbonyl, alkoxymethyl, alkoxyethyl, chlorobenzoyl, bromobenzoyl, chlorophenoxyacetyl, bromophenoxyacetal, cyclopropylcarbonyl, cyano, methanesulfonyl, alkanoylmethyl alkylmercaptomethyl, nitrobenzoyl, chlorocarbalkoxyl, bromocarbalkoxyl, ethynylmethyl, dialkylphosphono, dialkylthiophosphono or alkylmercaptocarbonyl, said alkanoyl, alkoxy, carbalkoxy and alkyl structures containing less than 10 carbon atoms.

3,723,494
DITHIOCARBAMATE ESTER BACTERICIDES AND FUNGICIDES

Thomas Andrew Lies, Montgomery Township, and James Wellington Clapp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed March 24, 1971, Ser. No. 127,825
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A 6 Claims

The invention is compounds of the formula:



wherein R_1 and R_2 are each lower alkyl C_1–C_4 ; R_3 is hydrogen or lower alkyl C_1–C_4 ; and Z is phenyl, 1-naphthyl or substituted phenyl and a method for preparing dithiocarbamate esters. The compounds are useful as bactericidal and fungicidal agents.

3,723,495
OLEFINIC BORATE ESTERS

Hans D. Holtz, Bartlesville, Okla., assignor to Phillips Petroleum Company

Division of Ser. No. 506,866, Nov. 8, 1965, Pat. No. 3,527,815. This application May 15, 1970, Ser. No. 37,933
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 A 3 Claims

Unsaturated alcohols such as 1,2-bis(2-hydroxy-3-cyclohexen-1-yl)ethylene are produced by the oxidation of a triolefin in the presence of a boron-containing compound, followed by hydrolysis of the resulting olefinic borate esters.

3,723,496
RESOLUTION OF DL-α-AMINO-α-VANILLYLPROPIONITRILES

Donald F. Reinhold; Meyer Sletzinger, both of North Plainfield, and John M. Chemerda, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 642,272, April 10, 1967, Pat. No. 3,505,385, which is a division of Ser. No. 309,379, , Pat. No. 3,366,679, which is a continuation-in-part of Ser. No. 229,961, , abandoned. This application July 9, 1969, Ser. No. 840,458
Int. Cl. C07c *121/78*
U.S. Cl. 260—465 E 1 Claim

A process of resolving DL-α-amino-α-vanillylpropionitrile by the use of 1-10-camphorsulfonic acid.

3,723,497
SILICONE COMPOSITIONS CATALYZED WITH PLATINUM II DIACETYLACETONATE

Ronald H. Baney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 19, 1971, Ser. No. 200,619
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 UA 13 Claims

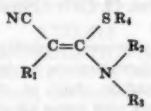
A curable organosilicon composition is prepared by mixing an organosilicon polymer containing aliphatic unsaturation, an organosilicon compound containing silicon-bonded hydrogen atoms and platinum II diacetylacetonate. The catalyzed composition remains uncurved over extended periods of time but can be cured to a rubber or a resinous product in a short period of time by heating.

3,723,498
PESTICIDAL 1-AMINO-1-MERCAPTO-2-CYANO-ETHENE DERIVATIVES

Alfred Joos, Frankfurter strasse 250, 61 Darmstadt, Germany

Filed June 17, 1969, Ser. No. 834,176
Claims priority, application Germany, June 24, 1968, P 17 68 784.2
Int. Cl. C07c 121/30
U.S. Cl. 260—465.4 22 Claims

Pesticidal, e.g. herbicidal, fungicidal and/or defoliating, compounds are provided of the following formula:

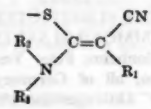


wherein

R_1 represents CN; $CONH_2$; $CONHCH_3$; or $COOR_2$,

R_2 and R_3 each represents hydrogen or alkyl of one to five carbon atoms, or together with the common N-atom, a piperidino, pyrrolidino or morpholine ring, and

R_4 is hydrogen, NH_4^+, an equivalent of a metal cation, or



3,723,499
PROCESS FOR THE PRODUCTION OF CYANOACETIC ACID

Pierre Barbezat, and Colm O. Murchu, both of Visp, Switzerland, assignors to Lonza Ltd., Gampel/Valais, Switzerland

Filed June 18, 1971, Ser. No. 154,683
Claims priority, application Switzerland, June 19, 1970, 9301/70
Int. Cl. C07c 121/40
U.S. Cl. 260—465.4 6 Claims

Cyanoacetic acid is prepared from a cyanoacetic ester by said hydrolysis with aqueous hydrochloric acid in a molar ratio of 1:0.25 - 0.55 at a temperature of 50° - 100°C.

3,723,500
BIS(2,3-DIMETHYLENEBUTYL)-CYANOMETHANE COMPOUNDS AND THEIR PREPARATION

Dale Robert Coulson, Kingsridge, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 21, 1970, Ser. No. 74,195
Int. Cl. C07c 121/30
U.S. Cl. 260—465.8 R 6 Claims

Novel polymer-forming mono- and bis(2,3-dimethylene-butyl)-bis(negatively substituted)methanes (e.g., bis(2,3-dimethylenebutyl)malononitrile) are prepared from allene and corresponding negatively substituted (activated) methanes (e.g., malononitrile in the presence of a palladium (O) or rhodium (I) catalyst.

3,723,501
LUBRICANT CONTAINING AN ALKALI METAL KETONE SALT AND ACRYLONITRILE

Louis DeVries, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 749,314, Aug. 1, 1968. This application June 2, 1970, Ser. No. 54,077
Int. Cl. C07c 121/00
U.S. Cl. 260—465.9 7 Claims

Dialkyl ketones having a relatively long oil soluble alkyl group are condensed as their anions with an acrylonitrile under mild conditions to provide lubricating oil detergent additives and emulsifiers.

3,723,502
CARBAMIC ACID DERIVATIVES

Giorgio Pifferi, Milan, Italy, assignor to Grupp Leptit S.p.A., Milan, Italy

Claims priority, application Italy, Oct. 29, 1968, 23092 A/68
Filed Oct. 29, 1969, Ser. No. 872,372
Int. Cl. C07c 125/06
U.S. Cl. 260—471 C 4 Claims

New derivatives of carbamic acid esters are referred to, having an anticonvulsant activity. There is also provided a method for preparing them, starting from a benzylamine and a carbonic acid derivative.

3,723,503
3,5-DIALKYL-4-HYDROXYPHENYLALKANOIC ACID ESTERS OF 3-HYDROXY-2,2-DIMETHYLPROPYL 3-HYDROXY-2,2-DIMETHYLPROPIONATE

Martin Dexter, Briarcliff Manor, N.Y.; John D. Spivack, Spring Valley, N.Y., and David Herbert Steinbeg, Bronx, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 1, 1971, Ser. No. 159,021
Int. Cl. C07c 69/76
U.S. Cl. 260—473 S 5 Claims

Esters of 3-hydroxy-2,2-dimethylpropyl 3-hydroxy-2,2-dimethylpropionate with 3,5-dialkyl-4-hydroxyphenylalkanoic acids are stabilizers of organic material. The compounds of which 3-hydroxy-2,2-dimethylpropyl-(3-hydroxy-2,2-dimethylpropionate)-bis[3-(3',5'-di-t-butyl-4'-hydroxyphenyl)propionate] is a typical embodiment, are prepared through esterification of 3-hydroxy-2,2-dimethylpropyl-3-hydroxy-2,2-dimethylpropionate.

3,723,504
PHARMACEUTICALLY ACTIVE DERIVATIVES OF ETHANOOCTA-HYDROPHENANTHRENE

Kyu Tai Lee, and Joel G. Whitney, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 709,908, March 4, 1968, Pat. No. 3,565,944. This application Feb. 11, 1971, Ser. No. 114,682
Int. Cl. C07c 55/10, 69/14
U.S. Cl. 260—479 R 5 Claims

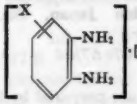
Certain novel disubstituted and polysubstituted derivatives of 2,4'-ethanooctahydrophenanthrene-2-methanol and 2,4'-ethanohexahydrophenanthrene-2-methanol are useful as antifertility agents when administered to animals.

3,723,505
SALTS OF CYANOCARBAMATES

Rudolph Schlatter, Chadds Ford, Pa., and Charles DeWitt Adams, Newark, Del., assignors to E. I du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 836,580, June 25, 1969, which is a continuation-in-part of Ser. No. 745,403, July 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 674,739, Oct. 12, 1967, abandoned, which is a continuation-in-part of Ser. No. 594,384, Nov. 15, 1966, abandoned. This application Feb. 4, 1971, Ser. No. 112,790
Int. Cl. C07c 125/04
U.S. Cl. 260—482 C 2 Claims

Compounds of the following formula are useful as fungicides:



where X is hydrogen, halogen, nitro or alkyl and R is alkyl of one to four carbons. Exemplary of these compounds is the salt of methyl cyanocarbamate with o-phenylenediamine.

3,723,506

OXIDATION OF SUGARS

Pierre Deslongchamps, Sherbrooke, Quebec, Canada, assignor to Universite De Sherbrooke, Sherbrooke, Quebec, Canada

Filed Aug. 11, 1971, Ser. No. 170,984

Int. Cl. C07c *69/66*

U.S. Cl. 260—484 R **6 Claims**

The invention relates to a process which comprises treating with ozone a glycopyranoside acetal, wherein the OR grouping is in the equatorial orientation with respect to the anomeric center, thereby to form the corresponding aldonic acid ester, and wherein R is alkyl, aryl, aralkyl or a sugar moiety.

3,723,507

PERFLUORO CYCLOALKYL ACRYLATES

Louis Gene Anello, Basking Rodge, and Richard P. Sweeney, Randolph Township, Dover, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 466,831, June 24, 1967, Pat. No. 3,520,863. This application June 8, 1970, Ser. No. 57,006

Int. Cl. C01c *69/52*

U.S. Cl. 260—486 H **10 Claims**

This invention relates to novel fluorinated acrylic monomers and polymers thereof and also to a novel method or approach for preparing certain of said monomers and polymers, together with the provision of certain novel intermediates produced thereby.

3,723,508

12,17-DIOXY AND 12-OXO-17-OXY-A-NORPROGESTERONES

Seymour D. Levine, Princeton, and Pacifio A. Principe, South River, both of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed June 25, 1965, Ser. No. 467,103

Int. Cl. C07c *49/44, 69/14, 69/16*

U.S. Cl. 260—488 B **5 Claims**

12-17-dioxy and 12-oxo-17-oxy-A-norprogesterones which are useful as anti-androgenic agents.

3,723,509

PRODUCTION OF CARBOXYLIC ESTERS

Guenther Matthias, Ludwigshafen; Werner Kasper, Frankenthal, and Gerhard Schulz, Ludwigshafen, all of Germany, assignors to Badische Anilin & Soda - Fabrik Aktiengesellschaft, Ludwigshafen am Rhineland, Rhineland-Pfalz, Germany

Filed Dec. 11, 1968, Ser. No. 783,109

Claims priority, application Germany, Dec. 13, 1967, P 16 43 712.0

Int. Cl. C07c *67/00*

U.S. Cl. 260—488 R **7 Claims**

Production of carboxylic esters by reaction of alcohols with ketenes in the presence of a catalyst, if desired in an inert solvent, in the presence of aluminum silicates having exchangeable cations.

3,723,510

PROCESS FOR PRODUCING ACETIC ESTERS OF BUTENEDIOL

Isao Ono; Tadahisa Yanagihara; Hiroaki Okada, and Takeshi Uotani, all of Shin-Nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Oaza-Tonda, Shin Nanyo-shi, Yamaguchi, Japan

Filed Dec. 9, 1971, Ser. No. 206,539

Claims priority, application Japan, Dec. 14, 1970, 45/110550

Int. Cl. C07c *67/04*

U.S. Cl. 260—497 R **8 Claims**

Acetic esters of butenediol are prepared by the reaction of butadiene, an oxygen containing gas and acetic acid in the presence of a catalytic amount of a catalyst system of at least one member being cupric bromide (II) and/or cupric acetate (II), and at least one member being an alkali or alkaline earth metal salt acetate and/or bromide.

3,723,511

PROCESS FOR PREPARING SALTS OF ALKYL AND ALKENYLGUANIDINES

Horst Prietzel, Trostberg, Germany, assignor to Suddeutsche Kalkstickstoff-Werke AG, Trostberg, Germany

Filed July 2, 1970, Ser. No. 52,113

Int. Cl. C07c *129/00*

U.S. Cl. 260—501.14 **6 Claims**

When monoalkylamines, dialkylamines, monoalkenylamines, or dialkenylamines having 11 to 18 carbon atoms in the hydrocarbon chain or chains are reacted in equimolecular amounts with lower alkanoic acids and cyanamide in the absence of solvents and at a temperature high enough to keep the mixture molten, but not much higher than 170°C., the expected substituted guanidine salts are formed quickly in yields of 90 percent or better. Impurities, such as iron ions, do not interfere and no pH adjustment is needed.

3,723,512

PERFLUOROALKYL SUBSTITUTED QUATERNARY AMMONIUM SALTS

Hans Niederprum, Monheim; Peter Voss, and Volker Beyl, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 9, 1970, Ser. No. 44,871

Claims priority, application Germany, June 11, 1969, P 19 29 665.2

Int. Cl. C07c *87/02*

U.S. Cl. 260—501.15 **10 Claims**

Quaternary ammonium salts of perfluorinated alkylsulfonic acids and their production from a tertiary amine, a perfluorinated alkylsulfonyl fluoride and an alkoxy- or aryloxysilane which contributes its alkyl or aryl radical to make up the fourth substituent of the resulting quaternary ammonium nitrogen atom.

3,723,513

ORGANIC DISULFIDE SULFINIC ACID COMPOUNDS

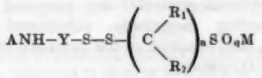
Lamar Field, Nashville, and Robert B. Barbee, Kingsport, both of Tenn., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 6, 1969, Ser. No. 874,677

Int. Cl. C07c *145/00*

U.S. Cl. 260—513.7 **5 Claims**

Organic disulfide compounds, useful as antiradiation agents, having the general formula



and their synthesis by subjecting 1,1-dioxides of heterocyclic disulfides to the action of a thiolate ion, whereby cleavage is effected between the sulfur and sulfonyl units. In the general formula: A may be a hydrogen, alkyl, or acyl grouping; Y may be a straight or substituted aliphatic chain having two or three carbon atoms interposed directly between the ANH grouping and the sulfur; R_1 and R_2 may be hydrogen, alkyl, aryl, or cycloalkyl; n may be the integers 3 through 5; q is 2 or 3; and M may be hydrogen or a metallic element as selected from group 1A of the Periodic Table such as sodium or potassium.

3,723,514
(-)THREO-3-(4-HYDROXY-3-METHOXYPHENYL)-SERINE
Balthasar Hegedus, 1 Im Marteli, Binningen, and Paul Zeller, 52 Rosenbergweg, Allschwil, both of Switzerland
Filed Jan. 15, 1970, Ser. No. 3,195
Claims priority, application Switzerland, Feb. 7, 1969, 1887/69
Int. Cl. C07c *101/32*
U.S. Cl. 260—519 1 Claim
A hypotensively active phenylserine derivative is described.

3,723,515
PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS
Bruno J. Barone, Houston, and Louis J. Croce, Seabrook, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.
Division of Ser. No. 755,775, Aug. 28, 1968, Pat. No. 3,678,105. This application Aug. 2, 1971, Ser. No. 168,457
Int. Cl. C07c *51/26, 63/02*
U.S. Cl. 260—523 A 5 Claims
A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,723,516
PROCESS FOR THE PREPARATION OF POLYBASIC BENZENE CARBOXYLIC ACIDS
Helmut Muller, and Karl Peterlein, both of Gladbeck, Germany, assignors to Gelsenberg Benzin Aktiengesellschaft, Gelsenkirchen-Horst, Germany
Continuation of Ser. No. 708,641, Feb. 16, 1968, abandoned. This application Nov. 2, 1970, Ser. No. 86,298
Claims priority, application Germany, Feb. 16, 1968, G 49309
Int. Cl. C07d *63/32, 63/14*
U.S. Cl. 260—524 R 4 Claims
Production of aromatic compounds having a multiplicity of carboxy groups pendant therefrom by vapor phase air oxidation of alkyl and nitrile substituted aromatic compounds to first produce the corresponding cyano alkyl substituted aromatic carboxylic acid or anhydride; and then hydrolyzing the nitrile to the free acid product.

3,723,517
OXIDATION OF ALKYL AROMATIC COMPOUNDS
Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed Dec. 28, 1970, Ser. No. 102,054
Int. Cl. C07c *47/54, 49/78, 63/02*
U.S. Cl. 260—524 R 9 Claims
Alkyl aromatic compounds, and particularly alkyl aromatic hydrocarbons, are oxidized by treating with an oxygen-containing gas in the presence of a catalyst comprising a thallium-containing compound to form oxygenated aromatic compounds.

3,723,518
PROMOTION OF THE OXIDATION OF MONONUCLEAR AROMATIC COMPOUNDS
Bruno J. Barone, and Louis J. Croce, Seabrook, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.
Division of Ser. No. 755,775, Aug. 28, 1968, Pat. No. 3,678,105. This application June 2, 1971, Ser. No. 149,385
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 5 Claims
A process for the oxidation of mononuclear aromatic compounds having at least one oxidizable group selected from methyl, hydroxymethyl, and aldehyde, at moderate temperatures, and in the presence of oxygen, cobaltous or cobaltic ions, and an effective amount of a specified substituted acid function.

3,723,519
METHOD OF PRODUCING ALLYLTHIOACETIC ACID
Vera Alexandrovna Portnyagina, poselok Novo-Boyarka ulitsa Bozhenko 13, and Maria Ivanovna Morgun, ulitsa Pobedy 1, kv. 8, both of Kiev, U.S.S.R.
Filed March 16, 1972, Ser. No. 235,402
Int. Cl. C07c *149/20*
U.S. Cl. 260—526 S 4 Claims
The method of producing allylthioacetic acid resides in that allyl bromide is reacted with thiourea at a temperature of 60° to 120°C, then monochloracetic acid is added to the resulting allylisothiouronium bromide and the mixture is heated at a temperature of 60° to 120°C in an alkaline medium, with subsequent isolation of the resulting desired product.

Allylthioacetic acid thus produced finds application as a catalyst for acrylonitrile polymerization, for synthesizing other high molecular compounds, as well as for producing new kinds of penicillin and in the synthesis of a number of medicinal preparations.

3,723,520
PROCESS FOR THE PREPARATION OF 1-HALOPHOSPHOLENES
Curtis P. Smith, Cheshire, and Henri Ulrich, North Branford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.
Filed June 1, 1971, Ser. No. 148,997
Int. Cl. C07d *105/02*
U.S. Cl. 260—543 P 20 Claims
A conjugated diene and a member of the group consisting of phosphorus trichloride, phosphorus tribromide and phosphorus triiodide are reacted together with white phosphorus in the presence of a compound which will inhibit polymerization of the conjugated diene; to prepare the corresponding 1-halophospholenes. The products of the process are novel compounds, useful as intermediates in the preparation of selective solvents and catalyst for the preparation of carbodiimides from isocyanates.

3,723,521
PROCESS FOR THE PREPARATION OF 1-HALOPHOSPHOLENES
Curtis P. Smith, Cheshire, and Henri Ulrich, North Branford, both of Conn., assignors to The Upjoin Company, Kalamazoo, Mich.
Filed June 1, 1971, Ser. No. 148,998
Int. Cl. C07d *105/02*
U.S. Cl. 260—543 P 7 Claims
Diels-Alder reaction adducts of a conjugated diene and a member of the group consisting of phosphorus trichloride, phosphorus tribromide and phosphorus tri-iodide are reduced with white phosphorus in an inert organic solvent, to prepare the corresponding 1-halophospholenes. The products of the process are novel compounds, useful as intermediates in the preparation of selective solvents and catalysts for the preparation of carbodiimides from isocyanates.

3,723,522
PRODUCTION OF THIOUREA
Hilde Kersten, Trennfurt; Gerhard Meyer, Obernburg, and Clemens Neuhaus, Erlenbach, all of Germany, assignors to Akzona Incorporated, Asheville, N.C.
Filed Nov. 12, 1970, Ser. No. 89,038
Claims priority, application Germany, Nov. 14, 1969, P 19 57 202.2
Int. Cl. C07c *157/00*
U.S. Cl. 260—552 R 7 Claims
A two-stage process for the production of thiourea from hydrogen sulfide and calcium cyanamide in which the

hydrogen sulfide is introduced into an aqueous suspension of the calcium cyanamide in a first stage at temperatures below about 80°C. and advantageously no higher than about 40°–60°C. under a reduced pressure of less than about 300 mm. Hg and the resulting mixture is then further reacted in a second stage at about 60°C. to 100°C. under approximately normal atmospheric pressure. The process is especially useful for the continuous production of thiourea.

3,723,523

N-(1,1-DIMETHYLPROPYNYL)-3,5-DICHLORO-4-METHYLBENZAMIDE

Bruce W. Horrom, Waukegan; Aldo J. Crovetti, Lake Forest, both of Ill., and Kenneth L. Viste, Warminister, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 804,678, March 5, 1969, which is a continuation-in-part of Ser. No. 671,946, Oct. 2, 1967, Pat. No. 3,534,098, which is a continuation-in-part of Ser. No. 608,271, Jan. 10, 1967, abandoned. This application Nov. 4, 1971, Ser. No. 195,824

Int. Cl. C07c *103/30*

U.S. Cl. 260—558 D **1 Claim**

The novel compound N-(1,1-dimethylpropynyl)-3,5-dichloro-4-methylbenzamide.

3,723,524

POLAR-SUBSTITUTED PROPANOLAMINES AS ANTI-ANGINA AND ANTI-HYPERTENSIVE AGENTS

Joachim Augstein, Linford; Allan L. Ham, Leeming; Peter R. Leeming, and Michael Snarey, both of Kent, all of England, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 877,006, Nov. 14, 1969, abandoned. This application May 11, 1970, Ser. No. 36,461

Claims priority, application Great Britain, Nov. 18, 1968, 54534/68; June 5, 1969, 28492/69

Int. Cl. C07c *103/28*

U.S. Cl. 260—559 S **12 Claims**

Novel propanolamine derivatives, especially 3-phenoxy-1-phenoxyalkylamino-2-propanols, useful in the treatment of hypertension and cardiac conditions, such as angina pectoris and cardiac arrhythmias.

3,723,525

2,4,'-DIAMINO DICYCLOHENZ

Robert J. Freure, Clarkson, Ontario, and Maurice Moyle, Oakville, Ontario, both of Canada, assignors to Gulf Oil Canada Limited, Toronto, Ontario, Canada

Division of Ser. No. 839,665, July 7, 1969, abandoned.

Filed Nov. 12, 1970, Ser. No. 89,053

Int. Cl. C07c *87/36*

U.S. Cl. 260—563 R **1 Claim**

A novel dicyclohexyl diamine is provided. A sequence of steps is disclosed whereby the novel diamine may be formed from diphenyl.

3,723,526

POLY (N-CYCLO ALKYLAMINOMETHYL) CYCLOPENTANES

William H. Edgerton, Strafford-Wayne, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed May 20, 1971, Ser. No. 145,565

Int. Cl. C07c *87/32*

U.S. Cl. 260—563 R **3 Claims**

Poly(N-cycloalkylaminomethyl)cyclopentanes and mixed poly(N-cycloaminomethyl)poly(hydroxymethyl)cyclopentanes are prepared by reducing the corresponding polyamido and polyamidopolyester derivatives of cis-cyclopentanetetracarboxylic acid. The compounds are useful as organic intermediates and in the polymer art.

3,723,527

1-NAPHTHYL-1-HYDROXY-ACETAMIDINE DERIVATIVES, THEIR PREPARATION AND USE

Louis Lafon, Paris, France, assignor to Societe anonyme dite: Orsymonde, Paris, France

Filed April 22, 1970, Ser. No. 31,007

Claims priority, application France, April 24, 1969, 6913031

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R **3 Claims**

1-Naphthyl-1-hydroxyacetamidines and their non-toxic salts are useful for treating arterial hypertension.

3,723,528

PROSTAGLANDIN OXIMES AND OXIME ETHERS

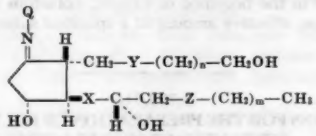
John E. Pike, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 673,979, Oct. 9, 1967, Pat. No. 3,636,120. This application Aug. 20, 1971, Ser. No. 173,660

Int. Cl. C07c *131/02*

U.S. Cl. 260—566 A **7 Claims**

This invention is a class of new organic compounds having the formula



wherein Q is —OH, —OR_2 wherein R_2 is alkyl of one to four carbon atoms, inclusive, or —$NHCOHN_2$, wherein X is —CH_2CH_2— or trans—CH=CH— and both Y and Z are —CH_2CH_2—, or wherein X is trans—CH=CH—, Y is cis—CH=CH—, and Z is —CH_2CH_2— or cis—CH=CH—, wherein *m* is 0, 1, or 2, and wherein *n* is 2, 3, 4, or 5. These compounds are useful intermediates for the preparation of the corresponding ketones having pharmacological activity e.g., nasal decongestants.

3,723,529

DECOLORIZATION OF POLYETHYLENE POLYAMINES

James William Pitts, Port Neches, and Charles Sam Steele, Nederland, both of Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed Oct. 19, 1970, Ser. No. 82,167

Int. Cl. C07c *85/16*

U.S. Cl. 260—583 N **10 Claims**

A process is provided for decolorizing "polyethylene polyamines," such as triethylenetetramine, and higher homologues, such as tetraethylenepentamine, by treatment with active carbon at elevated temperatures followed by distillation.

3,723,530

PRODUCTION OF MIXTURES OF MONOETHANOLAMINE AND TRIETHANOLAMINE

Walter Goetze; Peter Wolf; Gerhard Schulz, all of Ludwigshafen, and Horst Luedemann, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Nov. 4, 1970, Ser. No. 86,988

Int. Cl. C07c *85/06*

U.S. Cl. 260—584 R **13 Claims**

The production of mixtures of monoethanolamine and triethanolamine by reaction of diethanolamine and ammonia with ethylene oxide in certain molar proportions.

3,723,531

2-SUBSTITUTED-THIO-2-CYCLOHEXENE-1-ONE AND METHOD FOR PREPARING THEM

Michael A. Tobias, Edison, and Jerry G. Strong, Westfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 11, 1968, Ser. No. 743,970
Int. Cl. C07c *49/30, 45/100*
U.S. Cl. 260—586 R 6 Claims

2-Aliphatic- and arylthio-2-cyclohexen-1-ones are prepared by reacting a mercaptan (aliphatic or aryl) with 2,3-epoxycyclohexanone in the presence of an alkaline catalyst. Using techniques such as described in U.S. Pat. No. 3,317,552, the product cyclic ketones can be dehydrogenated to 2-(aliphatic- and aryl-thio) phenols, which are converted to N-methylcarbamates by reaction with methyl isocyanate. These carbamates have insecticidal activity against the housefly and misquito larva [e.g., Metcalf et al., J. Agr. Food Chem., 13, 473 (1965)].

3,723,532

PROCESS FOR PREPARING CYCLOALKENONES

James J. Louvar, Evanston, Ill., assignor to Universal Oil Products Comapny, Des Plaines, Ill.

Filed Sept. 16, 1968, Ser. No. 760,071
Int. Cl. C07c *45/04*
U.S. Cl. 260—586 B 7 Claims

Cycloalkenone compounds are prepared by contacting a mixture of water and a cycloalkene compound with an activated crystalline alumino-silicate at reaction conditions to form the desired product.

3,723,533

SUBSTITUTED NAPHTHALENONE AND NAPHTHALENEDIONE COMPOUNDS

Marinus Los, Edinburg, Scotland, assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 708,498, Feb. 27, 1968, Pat. No. 3,565,958. This application June 17, 1970, Ser. No. 47,164
Int. Cl. C07c *49/76*
U.S. Cl. 260—590 3 Claims

This invention relates to substituted naphthalenones and naphthalenediones useful in the synthesis of D-homosteroids. The latter steroids are useful as estrogenic agents in the treatment of laboratory and domestic animals.

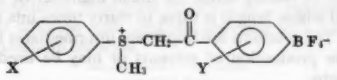
3,723,534

ARYL METHYL PHENACYL SULFONIUM TETRAFLUOROBORATES

Kenneth Wayne Ratts, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 28, 1971, Ser. No. 148,196
Int. Cl. C07c *49/76, 49/80*
U.S. Cl. 260—590 7 Claims

Compounds of the formula



wherein X and Y are like or unlike radicals selected from the group consisting of hydrogen, nitro, lower alkyl, lower alkoxy and halogen. These compounds are useful as insecticides, particularly in controlling soil insects of the genus Diabrotica.

3,723,535

PREPARATION OF KETONES

John F. Brennan, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 20, 1970, Ser. No. 13,195
Int. Cl. C07c *49/06, 49/08, 49/30*
U.S. Cl. 260—593 R 6 Claims

Ketones are prepared by treating secondary nitro-substituted compounds in the presence of a catalyst containing a metal of Group VIII of the Periodic Table at elevated temperatures and in a non-aqueous system. The invention is exemplified by the formation of acetone from 2-nitropropane.

3,723,536

PRODUCTION OF TRIARYL PHOSPHINES

Adolf Stuebinger, and Herbert Mueller, both of Frankenthal, Germany, assignors to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Land Rhineland-Pfalz, Germany

Filed Feb. 9, 1971, Ser. No. 114,063
Claims priority, application Germany, Feb. 19, 1970, P 20 07 535.8
Int. Cl. C07f *7/02*
U.S. Cl. 260—606.5 P 10 Claims

The production of triaryl phosphines from phosphorus halides and aryl halides in the presence of alkali metals in a Wurtz-Fittig type reaction. In order to carry out this reaction without risk, a dispersion of an alkali metal in an organic solvent is used which has been prepared with the addition of an aryl halide or a triaryl phosphine.

3,723,537

PROCESS FOR PREPARING ALKYLIDENE PHOSPHORANES

Joachim Buddrus, Dortmund, Germany, assignor to Badische Anilin-& Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Division of Ser. No. 832,498, June 11, 1969, Pat. No. 3,634,518. This application Aug. 12, 1971, Ser. No. 171,346
Int. Cl. C07f *9/28*; C07c *31/34*
U.S. Cl. 260—606.5 F 5 Claims

A process for forming in a reversible reaction an alkylidene phosphorane as used in the Wittig reaction by dehydrohalogenating the corresponding quaternary phosphonium chloride, bromide or iodide in which the phosphorus atom is connected by a single bond to a saturated carbon atom bearing at least one hydrogen atom wherein an epoxide is used as the dehydrohalogenating agent. The process preferably permits direct conversion of aldehydes or ketones into olefinic compounds by reaction with the quaternary phosphonium halige in the presence of the epoxide.

3,723,538

POLYCHLORO PARATHIO PHENOLS

William E. Bissinger, Akron; Donald E. Hardies, Wadsworth, and Jerome M. Lavanish, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 28, 1970, Ser. No. 76,651
Int. Cl. C07c *149/32*
U.S. Cl. 260—609 F 10 Claims

Chlorinated (alkylthio)phenols, chlorinated (alkenylthio)phenols, chlorinated (alkynylthio)phenols, and are described which are useful as miticides. These phenols often possess herbicidal, insecticidal, and/or fungicidal properties. Examples of these compounds are 2,3,5,6-tetrachloro-4-(methylthio)-phenol and 2,3,6-trichloro-4-(methylthio)phenol.

3,723,539

POLYMERIZATION OF GLYCIDYL 2,2-DINITRO-2-FLUOROETHOXIDE WITH A PREPOLYMER DIOL

Charles L. Hamermesh, Tarzana, and Stanley M. Hirshfield, Canoga Park, both of Calif., assignors to North American Rockwell Corporation, El Segundo, Calif.

Filed Sept. 8, 1969, Ser. No. 857,628
Int. Cl. C07c *43/12*
U.S. Cl. 260—615 BF 7 Claims

An epoxide monomer such as Glycidyl 2,2-dinitro-2-fluoroethoxide is polymerized by a cationic method using a Friedel-Crafts catalyst in the presence of a previously prepared diol whereby the diol is added to the growing end of the new chain of the polymerized epoxide monomer and ter-

minates its growth resulting in a new α,ω-dihydroxy polyether of a higher molecular weight.

3,723,540

PREPARATION OF HEXACHLOROPHENE

Edwin B. Michaels, Gregory Ct., East Norwalk, Conn., and John W. Lee, Glen Ave., Norwalk, Conn.

Filed Nov. 26, 1969, Ser. No. 880,373
Int. Cl. C07c 37/00
U.S. Cl. 260—619 A 7 Claims

A novel process is provided for preparing the well known germicidal compound hexachlorophene [i.e., bis-(3,5,6-trichloro-2-hydroxyphenyl)methane] by the condensation of a completely emulsified mixture of two mols of 2,4,5-trichlorophenol and about 1 mol of formaldehyde in the presence of sulfuric acid in concentrations of from above about 80 percent to less than about 92 percent at temperatures ranging from about 5°C. to about 75°C. above the temperatures at which emulsification is effected.

3,723,541

MANUFACTURE OF TRIMETHYL HYDROQUINONE

Ludwig Schuster, and Rudolf Oster, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Land Rheinland-Pfalz, Germany

Filed Aug. 5, 1970, Ser. No. 61,492
Int. Cl. C07c 39/08
U.S. Cl. 260—621 H 4 Claims

A catalytic process for the manufacture of trimethyl hydroquinone by reducing trimethyl p-quinone with hydrogen in the presence of an aliphatic alcohol of from three to five carbon atoms as solvent at temperatures ranging from 60° to 180°C.

3,723,542

PROCESS FOR PRODUCING 2-PINANOL

Rocco R. Risco, Oradell, and Seymour Lemberg, Elizabeth, both of N.J., assignors to Stephan Chemical Company, Maywood, N.J.

Filed Jan. 23, 1970, Ser. No. 5,364
Int. Cl. C07c 35/22, 73/00
U.S. Cl. 260—631.5 12 Claims

2-Pinanol is obtained upon oxidation of pinane in the presence of base, such as sodium hydroxide, and a free radical initiator, such as azobisisobutyronitrile. Oxygen is introduced into a mixture (anhydrous or aqueous) of pinane, base and initiator until the desired yield of pinanol is obtained, and the pinanol is recovered, as by extraction and distillation.

3,723,543

PROCESS FOR PREPARING 2,4,4,4-TETRACHLOROBUTANOL

Donald W. Kaiser, Hamden, and Craig K. Wood, North Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 21, 1970, Ser. No. 100,351
Int. Cl. C07c 31/34
U.S. Cl. 260—633 10 Claims

Carbon tetrachloride and allyl alcohol are reacted, in the presence of an improved catalyst system comprised of iron powder, iron chloride and a free radical generating azo compound, to obtain 2,4,4,4-tetrachlorobutanol in high yield and purity. The resulting chlorinated alcohol product is of utility in preparing 4,4,4-trichlorobutylene oxide which in turn is a useful intermediate in the preparation of chlorinated polyether polyols employed in making flame-retardant polyurethane foam.

3,723,544

PROCESS FOR CLEAVING DICHLOROISOPROPYL ETHER

Reginald F. Roberts, Jr., Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1971, Ser. No. 191,631
Int. Cl. C07c 31/34
U.S. Cl. 260—633 3 Claims

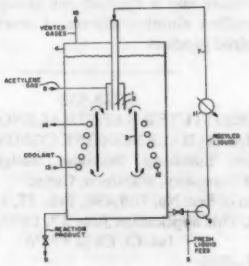
Process for the acidolysis or ether cleavage of dichloroisopropyl ether to convert it into propylene dichloride and propylene chlorohydrin by the steps of adding a catalytic amount of zinc chloride, aluminum chloride or ferric chloride to the dichloroisopropyl ether, heating the mixture in an atmosphere of hydrogen chloride gas, and recovering the products. The process is useful to convert waste streams containing dichloroisopropyl ether into valuable products.

3,723,545

PRODUCTION OF ALKYNOLS AND ALKYNEDIOLS

Otto Nagel, Hambach; Rolf Platz, Mannheim, and Werner Fuchs, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengellschaft, Ludwigshafen/Rhineland, Rhineland-Pfatz, Germany

Filed Feb. 6, 1970, Ser. No. 9,211
Int. Cl. C07c 33/04, 33/06
U.S. Cl. 260—635 Y 6 Claims



Production of alkynols and/or alkynediols by reaction of acetylene with aldehydes in a liquid reaction medium in the presence of a heavy metal acetylide as catalyst and in the presence or absence of basic reagents, at least one of the starting materials being introduced in gaseous form. The catalyst is suspended in the liquid medium and during the reaction a portion of the reaction medium is withdrawn and returned at the entry point below the level of the liquid of the gaseous starting material(s) at a speed of 5 to 100 meters per second into the reaction medium and is introduced into a chamber (located in the reaction medium and extending in the direction of the liquid returned) whose inlet opening has a mean diameter from twice to twenty times the mean diameter of the liquid nozzle and whose length is three to thirty times ints hydraulic diameter. The products are important intermediates for example for the production of solvents or may be used in electrolytic baths.

3,723,546

SELECTIVE PRODUCTION OF NITRO ALKANES

Gustave Bryant Bachman, and Robert Joseph Maleski, both of Lafayette, Ind., assignors to Purdue Research Foundation

Filed Sept. 17, 1971, Ser. No. 181,561
Int. Cl. C07c 79/04
U.S. Cl. 260—644 1 Claim

A process for the selective production of nitroalkanes by condensing a lower nitroalkane with an aldehyde to produce the corresponding nitroalcohol or diol, esterifying same, and reducing the ester group with sodium borohydride.

3,723,547

POLYSUBSTITUTED DIHYDROPYRENES

Luther A. R. Hall, Woodcliff Lake, N.J.; John A. Gurney, Tarrytown, N.Y., and Harris B. Renfroe, Montvale, N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 635,287, April 7, 1967, Pat. No. 3,557,218, which is a continuation-in-part of Ser. No. 499,064, Oct. 20, 1965, abandoned. This application Oct. 16, 1970, Ser. No. 81,631

Int. Cl. C07c *79/10*

U.S. Cl. 260—645 6 Claims

Photochromic 1,3,6,8-tetra(lower)alkyl-15,16-dimethyl-15,16-dihydropyrenes and 1,3,6,8-tetra(lower)alkyl-15,16-methylene-15,16-dihydropyrenes substituted with a nitro group in one or both of the 2- and 7- positions are prepared via substitution of the parent hydrocarbon. A typical embodiment is 2-nitro-1,3,56,8,15,16-hexamethyl-15,16-dihydropyrene.

3,723,548

CHLOROMETHYLATION PROCESS

Frank S. Adams, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 14, 1971, Ser. No. 189,277

Int. Cl. C07c *25/14*

U.S. Cl. 260—651 HA 6 Claims

An improved process for the chloromethylation of polyalkylbenzene employing a particular combination of chloromethylation agents, an emulsifier and specific reaction conditions.

3,723,549

PROCESS FOR PREPARING VINYLIDENE FLUORIDE

Franz Kaess, Traunstein; Klaus Lienhard, Trostberg-Mogling, and Horst Michaud, Trostberg, all of Germany, assignors to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft, Trostberg, Oberbayern, Germany

Division of Ser. No. 756,329, Aug. 29, 1968. This application Aug. 11, 1971, Ser. No. 171,023

Claims priority, application Germany, Aug. 29, 1967, S 111 575; Aug. 29, 1967, S 111 576

Int. Cl. C07c *21/18*

U.S. Cl. 260—653.3 8 Claims

Vinylidene fluoride is produced by the gaseous phase reaction of vinylidene chloride with at least 2 mols of hydrofluoric acid per mol of vinylidene chloride at a temperature of from 200° to 400°C. in presence of a catalyst selected from trivalent chromium salts and aluminum fluoride activated with a vanadium, tin or lanthanum compound.

3,723,550

PURIFICATION OF VINYL CHLORIDE

Russell Thomson McFadden, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 10, 1970, Ser. No. 62,724

Int. Cl. C07c *21/06*

U.S. Cl. 260—656 R 3 Claims

A method for removing unsaturates, particularly diolefins such as butadiene, from vinyl chloride, by contacting the impure vinyl chloride with catalytic amounts of a Lewis Acid such as aluminum chloride.

3,723,551

PROCESS FOR THE REMOVAL OF MINUTE QUANTITIES OF 1,3-CYCLOPENTADIENE FROM ISOPRENE AND/OR CYCLOPENTENE

H. Dieter Kohler; Gunther Schnuchel, and Helmut Scherb, all of Dormagen, Germany, assignors to Erdolchemie Gesellschaft mit beschrankter Haftung, Cologne, Germany

Filed Aug. 17, 1971, Ser. No. 172,576

Claims priority, application Germany, Aug. 21, 1970, P 20 41 548.9

Int. Cl. C07c *7/12*

U.S. Cl. 260—666 A 4 Claims

1,3-cyclopentadiene is removed from isoprene and/or cyclopentene when present in amounts of less than 2,000 ppm by contact with a basic ion-exchanger which has been converted into the hydroxy form by preliminary treatment with a strong base.

3,723,552

PROCESS FOR THE ISOMERIZATION OF HYDROCARBONS

Roy T. Mitsche, Island Lake, and Edward Michalko, Lombard, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 20,024, March 16, 1970, Pat. No. 3,677,973. This application Dec. 28, 1970, Ser. No. 101,675

Int. Cl. C07c *5/24*

U.S. Cl. 260—668 A 11 Claims

A process for isomerizing isomerizable hydrocarbons using a catalytic composite comprising a zeolite with a mordenite crystal structure containing alumina fixed in combination therewith. Elimination of hydrogenation in the isomerization reaction results in a higher rate of conversion to the desired products.

3,723,553

CYCLOTRIMERIZATION OF BUTADIENE, USING NICKEL CATALYST

Ching Yong Wu, Pittsburgh, and Harold E. Swift, Gibsonia, both of Pa., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 27, 1971, Ser. No. 212,726

Int. Cl. C07c *3/10*

U.S. Cl. 260—666 B 6 Claims

Butadiene is cyclotrimerized to 1,5,9-cyclododecatriene in the presence of a catalyst consisting of a trialkyl aluminum, nickel (II) acetylacetonate, and a Schiff base prepared by the condensation of the aldehyde or ketone of a heterocyclic compound with an aniline or toluidine compound.

3,723,554

HYDROCARBON ISOMERIZATION PROCESS

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 852,463, Aug. 22, 1969, Pat. No. 3,630,961, which is a continuation-in-part of Ser. No. 835,218, June 20, 1969, abandoned. This application Feb. 16, 1971, Ser. No. 115,699

Int. Cl. C07c *5/24*

U.S. Cl. 260—668 A 18 Claims

A process for isomerizing isomerizable hydrocarbons, utilizing a catalytic composite comprising a combination of a platinum group component and a lead component uniformly distributed throughout a porous carrier material wherein the catalytic composite contains, on an elemental basis, about 0.01 to about 2 wt.% platinum group component and lead in an atomic ratio of lead to platinum group component of from about 0.05:1 to about 0.9:1, is disclosed.

3,723,555

PRODUCTION OF 1-METHYL-3-PHENYLINDANS

Herbert Armbrust, Gruenstadt; Gerhard Kilpper, Mannheim; Waldemar Koehler; Hans-Georg Schecker, both of Ludwigshafen, and Hans-Juergen Sturm, Gruenstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed June 3, 1971, Ser. No. 149,779

Int. Cl. C07c *15/20*

U.S. Cl. 260—668 F 10 Claims

The production of 1-methyl-3-phenylindans by dimerization of styrenes in the presence of catalysts and poly-merization inhibitors. The products are valuable starting materials for the production of dyes and pesticides.

3,723,556

HYDROCARBON ISOMERIZATION PROCESS

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 36,375, May 11, 1970, Pat. No. 3,705,111, which is a continuation-in-part of Ser. No. 15,960, March 2, 1970. This application March 1, 1972, Ser. No. 231,033

Int. Cl. C07c *5/24*

U.S. Cl. 260—668 A 20 Claims

Isomerizable hydrocarbons are isomerized using a catalytic composite comprising a combination of a platinum group component, a Group IV-A metallic component, and a nickel component with a porous carrier material. A catalytic composite comprising a platinum group component, a Group IV-A metallic component, a nickel component and a Friedel-Crafts metal halide component combined with a refractory inorganic oxide is also disclosed.

3,723,557

DEHYDROGENATION WITH A CATALYTIC COMPOSITE CONTAINING PLATINUM, RHENIUM, GERMANIUM AND AN ALKALI OR ALKALINE EARTH METAL

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 13,777, Feb. 24, 1970, Pat. No. 3,649,564, which is a continuation-in-part of Ser. No. 839,086, July 3, 1969, abandoned. This application Jan. 13, 1972, Ser. No. 217,663

Int. Cl. C07c *5/18*

U.S. Cl. 260—668 D 20 Claims

Dehydrogenatable hydrocarbons are dehydrogenated by contacting them at dehydrogenation conditions with a catalytic composite comprising a combination of catalytically effective amounts of a platinum group component, a rhenium component, a germanium component and an alkali or alkaline earth metal with a porous carrier material. A specific example of the catalytic composite disclosed herein is a combination of a platinum component, a rhenium component, a germanium component and an alkali or alkaline earth component with an alumina carrier material, wherein the components are present in amounts sufficient to result in the composite containing, on an elemental basis, 0.01 to 2 wt. % platinum, 0.01 to 2 wt. % rhenium, 0.01 to 5 wt. % germanium and 0.1 to 5 wt. % of alkali or alkaline earth metal.

3,723,558

PRODUCTION OF PURE P-XYLENE

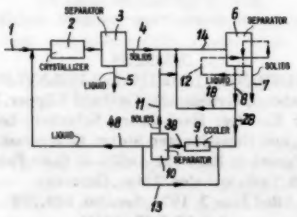
Freidrich Kramer, Gelsenkirchen, Germany, assignor to Fried Krupp Gesellschaft Mit Beschrankter Haftung, Essen, Germany

Filed Sept. 30, 1970, Ser. No. 76,711

Claims priority, application Germany, Oct. 1, 1969, P 19 49 446.3

Int. Cl. C07c *7/14*

U.S. Cl. 260—674 A 11 Claims



P-xylene is separated from a liquid hydrocarbon mixture of p-xylene and at least one other isomeric xylene by crystallizing p-xylene from the mixture and subsequently separating p-xylene crystals in a first and in a subsequent second separator which furnishes a p-xylene end product having a purity of more than 98 percent by weight and from which the liquid effluent containing p-xylene is partially recirculated into the feed stream of the second separator and is partially recirculated through an additional crystallizer and separator so that the resulting crystals are admixed with feed for the second separator and the liquid effluent is admixed with the feed for the first crystallizer.

3,723,559

PROCESS FOR THE PRODUCTION OF EPOXIDES CONTAINING NITROGEN AND SULPHUR

Richard Alan Oswald, Cambridge, and Bernard Peter Stark, Cambridge, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 769,389, Oct. 21, 1968, abandoned. This application May 19, 1971, Ser. No. 145,021

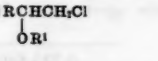
Claims priority, application Great Britain, Oct. 26, 1967, 48,796/67

Int. Cl. C08g *9/32*

U.S. Cl. 260—67.6 R 11 Claims

Process for preparing a 1,2-epoxide containing nitrogen and sulphur which comprises:

reaction of a monothiol (I) of formula



(I)

where R is a divalent organic radical and OR^1 is a hydroxyl group or ester group, with a substance (II) containing, directly attached to a nitrogen atom, at least one group of formula

where X^1 is hydrogen or a monovalent organic radical, and X is hydrogen or an alkyl or alkenyl group containing not more than six carbon atoms;

when OR^1 denotes an ester group, hydrolyzing this group to a hydroxyl group;

and dehydrochlorinating the intermediary 1,2-chlorohydrin so obtained to the 1,2-epoxide.

3,723,560

HYDROGENATION CATALYST AND PROCESS

William K. T. Gleim, Island Lake, and Frederick C. Ramquist, Stickney, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed March 19, 1971, Ser. No. 126,262

Int. Cl. C07c *11/02;* B01j *11/06*

U.S. Cl. 260—677 H 9 Claims

Group V-B metal hydrides as hydrogenation catalysts. Especially adaptable for the selective hydrogenation of di-olefins to mono-olefins—e.g., the hydrogenation of butadiene to 1- and 2-butene.

3,723,561

THE SELECTIVE SEPARATION OF BUTENE-1 FROM A C HYDROCARBON MIXTURE EMPLOYING ZEOLITES X AND Y

James W. Priegnitz, Elgin, Ill., assignor to Universal Oil Products Company, Des Plains, Ill.

Filed Dec. 1, 1971, Ser. No. 203,837

Int. Cl. C07c *11/12*

U.S. Cl. 260—677 AD 24 Claims

A process for the separation of butene-1 from other C_4 mono-olefins. A feed stream containing butene-1 along with another C_4 mono-olefin is contacted with a crystalline alu-

minosilicate adsorbent selected from the X or Y zeolites containing barium or potassium cations at conditions to effect the selective adsorption of butene-1. The butene-1 adsorbed by the adsorbent is thereafter recovered as a purified product.

3,723,562

CONVERSION OF OLEFINS

Louis F. Heckelsberg, Bartlesville, Okla., assignor to Phillips Petroleum Company

Continuation of Ser. No. 710,393, March 4, 1968, abandoned. This application Oct. 8, 1970, Ser. No. 79,328

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D **9 Claims**

An olefin hydrocarbon, for example, propylene and/or a butene, is converted to at least one other olefin hydrocarbon, for example, isoamylenes, in a catalytic conversion process utilizing simultaneous or sequential contacting of an olefin reaction catalyst and a skeletal isomerization catalyst.

3,723,563

DISPROPORTIONATION OF OLEFINS

Christopher Patrick Cadman Bradshaw, Sunbury-on-Thames, England, assignor to The British Petroleum Company, Limited, London, England

Continuation of Ser. No. 799,497, Feb. 14, 1969, abandoned. This application July 12, 1971, Ser. No. 162,021

Claims priority, application Great Britain, March 5, 1968, 10,629/68

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D **6 Claims**

A catalyst for olefin disproportionation comprises a molybdenum or tungsten salt and a Group IV*b* organometallic compound. A preferred system is tungsten hexachloride and tetra-n-butyl tin.

3,723,564

ISOMERIZATION OF BUTENE-1 TO CIS-BUTENE-2

Calvin M. Tidwell, and Val G. Henneberg, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Nov. 24, 1969, Ser. No. 879,581

Int. Cl. C07c *5/30*

U.S. Cl. 260—683.2 **10 Claims**

Butene-1 is isomerized principally to cis-butene-2 by contacting butene-1 in liquid phase with a molecular sieve having an effective pore size of greater than 5 and less than 10 A. at e.g. 100°C. Prior to use the molecular sieve was activated at a temperature of 400°–450°C. in a stream of nitrogen and 3 percent oxygen. Conversion to butene-2 was 32 mole percent of which 51.3 percent was the cis form. The cis-butene-2 is a useful feed for oxidative dehydrogenation to butadiene.

3,723,565

OLEFIN FEED PURIFICATION IN AN ALKYLATION PROCESS

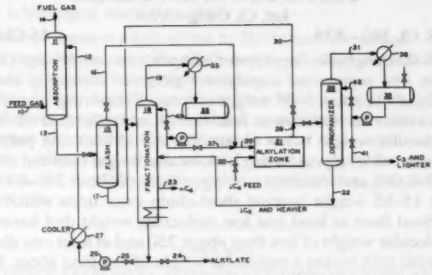
Miles L. Henderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 19, 1971, Ser. No. 173,069

Int. Cl. C07c *3/52*

U.S. Cl. 260—683.43 **5 Claims**

An olefin stream, e.g., ethylene, produced, for example, by naphtha cracking and containing methane and hydrogen impurities is absorbed from the major portion of the impurities using a portion of the subsequently produced alkylate. Alkylate containing absorbed ethylene is flashed, the liquid remaining after flashing is passed to a fractionation column



from which an isoparaffin such as isobutane is removed and admixed with flashed vaporous ethylene, and the mixture is charged as feed to an alkylation process.

3,723,566

ORGANOSILOXANE POLYAMIDE BLOCK COPOLYMERS

John Thompson, Barry, Glamorgan, and Michael James Owen, Penarth, Glamorgan, both of Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England

Filed April 29, 1971, Ser. No. 138,800

Claims priority, application United Kingdom, May 4, 1970, 21,379/70

Int. Cl. C08g *47/10, 41/04*

U.S. Cl. 260—824 **7 Claims**

Organosiloxane-polyamide block copolymers useful as additives to nylon products providing durable low energy surfaces exhibiting low coefficient of friction and as modified nylon exhibiting excellent bonding to glass are defined as block copolymers containing at least one polyamide block of two or more units of the general formula

where R is an alkylene radical of two to 15 carbon atoms and an organosiloxane block containing two or more units of the general formula $R'_aSiO_{(4-a/2)}$ where a is 1, 2 or 3, and R′ is a hydrocarbyl or halogenohydrocarbyl of one to 18 carbon atoms or a divalent organic radical, at least one R′ being a divalent organic radical linking the siloxane block to the polyamide block.

3,723,567

STABLE ORGANOSILICON COMPOSITIONS

Alan E. Mink, and Darrell D. Mitchell, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 25, 1971, Ser. No. 174,954

Int. Cl. C08g *47/02*

U.S. Cl. 260—825 **10 Claims**

Organosilicon compositions comprising a first component having at least two monovalent hydrocarbon radicals containing aliphatic unsaturation per molecule, a second component containing at least two silicon-bonded hydrogen atoms, and a platinum catalyst are inhibited by the addition of an amine-functional silane to decrease the rate of curing at room temperature. The compositions can be readily cured at elevated temperatures to provide coating resins, potting compounds and silicone elastomers.

3,723,568

SEGMENTED THERMOPLASTIC COPOLYESTERS MODIFIED WITH POLYEPOXIDES

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1972, Ser. No. 230,045
Int. Cl. C08g *45/14*
U.S. Cl. 260—835 16 Claims

A thermoplastic copolyester composition comprising: (a) at least one segmented copolyester polymer consisting essentially of (1) about 5–85 weight percent of recurring long-chain ester units derived from at least one dicarboxylic acid having a molecular weight below about 300 and at least one poly(alkylene oxide) glycol having a molecular weight between about 400–6,000 and a carbon to oxygen ratio of about 2.0–4.3 and (2) 15–95 weight percent short-chain ester units which are derived from at least one low molecular weight diol having a molecular weight of less than about 250 and at least one dicarboxylic acid having a molecular weight of less than about 300, and (b) from 0.5–10 equivalents, per equivalent of carboxyl group contained in said copolyester of a polyepoxide having a functionality of not less than about 2.

3,723,569

BLENDS OF COPOLYESTERS WITH CURED EPOXY RESINS

Guenther Kurt Hoeschele, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed March 20, 1972, Ser. No. 236,445
Int. Cl. C08g *45/14*
U.S. Cl. 260—835 16 Claims

An improved usually thermosetting copolyester composition comprising:

a. at least one segmented copolyester polymer consisting essentially of (1) about 5–85 weight percent of recurring long chain ester units derived from at least one dicarboxylic acid having a molecular weight below about 300 and at least one poly- (alkylene oxide) glycol having a molecular weight between about 400–6,000 and a carbon-to-oxygen ratio of about 2.0–4.3 and (2) about 15–95 weight percent of short chain ester units which are derived from at least one low molecular weight diol having a molecular weight of less than about 250 and at least one low molecular weight dicarboxylic acid having a molecular weight of less than about 300,
b. about 1.0 to 50 percent by weight based on said copolyester, of a polyepoxide having a functionality of at least two and
c. about 0.5 to 1.1 equivalents, per epoxy equivalent, of an epoxy curing agent selected from aromatic and aliphatic polyamines and cyclic anhydrides of polycarboxylic acids.

Optionally from 0.05 to 0.5 weight percent based on said copolyester of an epoxy catalyst may be included in the composition.

3,723,570

ETHYLENE-VINYL ACETATE-ALLYL GLYCIDYL ETHER TERPOLYMER WITH POLYVINYL CHLORIDE

Robert Leonard Adelman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 843,858, July 22, 1969, which is a continuation-in-part of Ser. No. 441,354, March 19, 1965, abandoned. This application July 29, 1971, Ser. No. 167,467
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 4 Claims

Specific copolymers of ethylene, a vinyl ester, and allyl glycidyl ether are disclosed as being particularly suitable plasticizers for polymers such as polyvinyl chloride. The copolymers have a molecular weight of about 400–3,000 and comprise 15–40 weight percent ethylene, 35–70 weight percent vinyl ester, and 15–35 weight percent allyl glycidyl ether.

3,723,571

DISPERSION POLYMERIZATION OF VINYLIDENE CHLORIDE COPOLYMER

Vernon Charles Haskell, Sleepy Hollow Estates, Va., assignor to E. I. duPont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 18,391, Feb. 27, 1970, which is a division of Ser. No. 652,684, July 12, 1967, abandoned. This application Nov. 19, 1971, Ser. No. 200,612
Int. Cl. C08f *15/40*
U.S. Cl. 260—836 2 Claims

A process for preparing a copolymer of vinylidene chloride is provided wherein the copolymer is of between 70 percent and 85 percent by weight of vinylidene chloride and is of spherical particle form wherein the spherical particles have a diameter between 1 and 5 microns, and wherein the copolymer is prepared in the presence of a polymeric dispersing agent.

3,723,572

SYNTHETIC RESINS

Johannes Reese, and Hermann Hotze, both of Wiesbaden-Biebrich, Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

Filed March 13, 1970, Ser. No. 19,464
Int. Cl. B05b *5/00*; C08g *39/10*
U.S. Cl. 260—860 9 Claims

A thermosetting resinous composition which comprises a pulverulent mixture of (A) a synthetic resin component containing free hydroxyl groups and (B) a synthetic resin component containing free carboxyl groups, both of said components having a melting point of at least 50°C, a process for powder coating and for forming a moulded article by using said composition.

3,723,573

PROCESS FOR PREPARING UNSATURATED POLYESTER

Robert M. Thompson, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Nov. 11, 1971, Ser. No. 197,983
Int. Cl. C08f *21/02*; C08g *17/12*
U.S. Cl. 260—866 21 Claims

An unsaturated polyester is prepared via an epoxide-anhydride process wherein the copolymerization occurs in the presence of a reactive diluent, initiator, mild catalyst and a free radical inhibitor at a temperature of 20°C. – 175°C.

3,723,574

BLOCK COPOLYESTERS CONSISTING ESSENTIALLY OF LINEAR SATURATED POLYESTER AND POLYSTYRENE-BUTADIENE UNITS

Ludwig Brinkmann, and Walter Herwig, both of Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucuis & Brunning, Frankfurt am Main, Germany

Continuation of Ser. No. 761,314, Sept. 20, 1968, abandoned. This application Jan. 22, 1971, Ser. No. 108,987
Claims priority, application Germany, Oct. 7, 1967, P 16 94 197.2
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 12 Claims

Thermoplastic block copolyesters comprising linear saturated polyesters and polystyrene-butadiene units which can be moulded into shaped articles having a high dimensional stability, impact strength and bending strength.

3,723,575

METHOD OF PRODUCING GRAFT POLYMERS

William John Kern, Barberton; Thomas Chester Bouton, Akron, and Harold Elwood Adams, Cuyahoga Falls, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed April 14, 1971, Ser. No. 134,058
Int. Cl. C08f *19/08, 15/04, 15/02*
U.S. Cl. 260—879 11 Claims

Graft polymers are produced by polymerizing a first monomer charge at a relatively low temperature, heat-treating the polymer, and charging additional monomer. The first monomer charge contains at least one conjugated diene of from four to eight carbons, and the first polymerization step is performed in the presence of a hydrocarbon lithium initiator. The heat-treating step is performed on the base polymer at 70°–130Φυ C. for 2 – 200 hours.

3,723,576

SURFACE COATING COMPOSITIONS COMPRISING BLENDS OF VINYL CHLORIDE HOMOPOLYMERS

Ian A. Maclaine, Lachine; Orest T. Semeniw, L'Acadie, Montreal, both of Quebec, Canada, and Domco Industries Limited, 03, Montreal, Quebec, Canada

Filed May 11, 1970, Ser. No. 36,428
Int. Cl. C08f *29/24, 3/30*
U.S. Cl. 260—899 3 Claims

A granular composition for use in the production of decorative surface coatings comprises a dry blended non-homogeneous mixture of non-adherent granules consisting of a first and a second vinyl chloride homopolymer, plasticizer, and heat and light stabilizers, the vinyl chloride homopolymers having specific viscosities in the range 0.10 – 0.15 as measured in a solution of 0.2 grams of homopolymer in 100 ml. of nitrobenzene at 25°C, the specific viscosity and average granule size of the first homopolymer being less than those of the second.

3,723,577

FLUORINATED ELASTOMER BLENDS

David A. Stivers, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 5, 1970, Ser. No. 87,359
Int. Cl. C08f *29/22*
U.S. Cl. 260—900 5 Claims

A fluoroelastomer combination is provided having improved processing and handling characteristics. The fluoroelastomer combination comprises at least two highly fluorinated elastomeric polymers, one of said polymers being dispersed throughout a continuous phase of the other of said polymers.

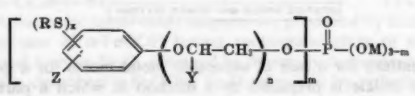
3,723,578

PHOSPHATE ESTERS OF ETHERS OF THIOL SUBSTITUTED PHENOLS

Fred S. Eiseman, Jr., Maplewood; Leslie M. Schenck, Mountainside, both of N.J., and John P. G. Beiswanger, Audubon, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 13, 1970, Ser. No. 80,477
Int. Cl. C07f *9/12*; C10m *7/46*
U.S. Cl. 260—949 12 Claims

Sulfur containing phosphate esters of thio ethers of phenols and alkoxylated phenols are described, together with method for their preparation and their use as lubricants. The sulfur containing phosphate esters described are represented by the general formula:



wherein:

R is an alkyl group of one to 20 carbon atoms, phenyl or aralkyl

x is an integer of from 1 to 3 inclusive

n is an integer of from 0 to 50 inclusive (preferably 1–20)

m is an integer of 1 to 3 inclusive

Y is hydrogen, methyl or ethyl

Z is hydrogen or alkyl, of one to 20 carbons atoms and

M is a cation, e.g., H, alkali metal, alkaline earth metal, heavy metal, ammonium or amino.

These sulfur containing phosphate esters have valuable lubricating properties and exhibit good anti-wear extreme pressure properties both alone or in water or as additives to other lubricants, such as mineral oils, especially for use as cutting oils or other metal working applications, gear lubricants, etc.

3,723,579

LYOPHILIZED ARYL PHOSPHATE MONOESTERS AND PROCESS THEREFOR

Frank E. Hammer, Chicago, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Sept. 8, 1969, Ser. No. 856,205
Int. Cl. C07f *9/12*; G01n *31/14*
U.S. Cl. 260—954 2 Claims

Lyophilized aryl phosphate monoesters having a pH of substantially 1 to 4 upon reconstitution with the amount of water removed during lyophilization; are prepared by lyophilizing an aqueous solution of the aryl phosphate monoesters having a pH of substantially 1 to 4. Diagnostic compositions for the determination of phosphates in which the lyophilized aryl phosphate monoesters are employed.

3,723,580

CONTINUOUS PROCESS FOR MANUFACTURING O,O-DIALKYL-CHLOROTHIOPHOSPHATE

Ken Ito, Toyonaka; Shinichiro Terao, Ashiya; Hirotaka Sugahara, Toyonaka; Takashi Yamada, Nishinomiya; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Hiroshi Yoshitake, Minoo, and Hidekazu Fujino, Moriguchi, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed May 18, 1970, Ser. No. 38,309
Int. Cl. C07f *9/20*
U.S. Cl. 260—974 3 Claims

O,O- is continuously prepared in high yield from phosphorus sulfochloride and sodium lower-alcoholate by continuously supplying to a reaction system 2.0 to 2.3 parts by mole of sodium low-alcoholate in a form of a lower alcohol solution, on the basis of one part by mole of phosphorus sulfochloride, along the direction of stream in a divisional manner in 3 to 8 fractions, substantially smaller amounts of the fractions being supplied thereto towards the downstream side of the reaction system, while effecting stirring of the reaction system, keeping an average residence time of reacting solution in the entire system within 6 hours and the temperature of the reaction system at 30°C or less. O,O-di-lower-alkylchlorothiophosphate is an intermediate for agricultural chemicals of organic phosphorus series or for lubricants or stabilizers.

ERRATUM

For Class 264—289 see:
Patent No. 3,723,438

3,723,581
METHOD OF PRODUCING FUEL AND/OR BREEDER ELEMENTS FOR NUCLEAR REACTORS

Alfred Boettcher, Aachen, and Hubertus Nickel, Julich, both of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

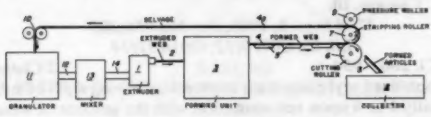
Filed April 18, 1969, Ser. No. 817,553
Int. Cl. G21c *21/00*
U.S. Cl. 264—0.5 4 Claims

Coated particles used in making fuel and/or breeder elements are mixed with carbides and then heat hardened to form a compound member.

3,723,582
METHOD FOR RECLAIMING THE SELVAGE OF FOAMED THERMOPLASTIC WEB

Thomas W. Winstead, 2 Overlook Lane, Baltimore, Md.

Continuation-in-part of Ser. No. 719,057, April 5, 1968, abandoned. This application May 22, 1970, Ser. No. 39,851
U.S. Cl. 264—37 13 Claims

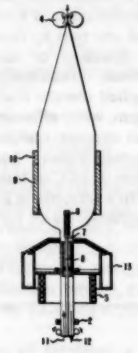


A method of reclaiming the selvage remaining in an extruded sheet of foamed thermoplastic material after the molding of articles from the sheet, in which the reclaiming steps are integrated with the extrusion and forming steps in a continuous system. Immediately after forming the articles and cutting them from the sheet, the foamed selvage is collapsed and densified before air has penetrated the cells thereof, and thereafter it is granulated, mixed with virgin extrusion pellets, and the mixture is returned to the extrusion step for re-use.

3,723,583
ORIENTATION OF TUBULAR POLYPROPYLENE FILM

Ralph Allen Hovermale, Clinton, Iowa; George Joseph Ostapchenko, Williamsville, N.Y., and Hung Kan Yang, Clinton, Iowa, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 765,177, Oct. 4, 1968, abandoned. This application Feb. 10, 1971, Ser. No. 114,355
Int. Cl. B29c *17/07*; B29d *7/24*
U.S. Cl. 264—40 3 Claims

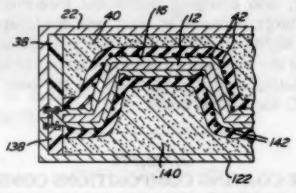


A process for orienting tubular polypropylene film to minimize shrinkage and total haze of the oriented film comprising reducing the temperature drop and maintaining a low bubble hoop stress prior to quenching.

3,723,584
METHOD OF MAKING AN ELECTROFORMED MOLD HAVING HEAT TRANSFER CONDUITS AND FOAM POLYURETHANE FOUNDATION

Frank J. Nussbaum, New York, N.Y., assignor to Bischoff Chemical Corporation, Hicksville, N.Y.

Continuation-in-part of Ser. No. 752,518, Aug. 14, 1968. This application Dec. 15, 1969, Ser. No. 884,896
Int. Cl. B29d *27/04*
U.S. Cl. 264—45 1 Claim

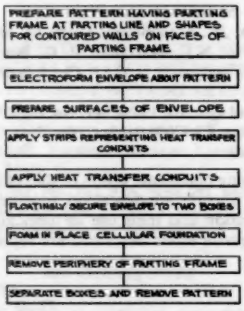


Molds are produced by providing a master of relatively inexpensive material, preferably wood. The wood is coated with a material which will have the texture and dimensions of the end product to be produced. The coating material must be inert to a plating solution and must be conductive to permit deposition of the plating solution thereon. The master thus produced is electroformed to provide a metallic envelope of copper, nickel, or mixtures thereof thereabout. A box, open at one end, including a rear plate and peripheral frame members is provided for each contoured wall. Wax rods are mounted on the electroformed envelope. The wax rods communicate with the ends of metal tubing. A layer of silicone rubber or similar material is applied over the wax rods and the ends of the tubing. The wax rods are melted thus forming heat transfer conduits. An insulating foundation of polymethane is foamed in place between the rear face of the boxes and the rear face of the contoured walls. Thereafter, the electroformed envelope is severed about its periphery and the mold halves are removed for use with low pressure injection molding apparatus. Floating connectors associate the contoured walls of the mold with the frame members of the box so that relative thermal expansion of the box independently of the contoured walls is possible.

3,723,585
METHOD OF ELECTROFORMED MOLDS

Frank J. Nussbaum, 220 Miller Rd., Hicksville, N.Y.

Continuation-in-part of Ser. No. 752,518, Aug. 14, 1968, abandoned, and a continuation-in-part of Ser. No. 884,896, Dec. 15, 1969. This application March 6, 1970, Ser. No. 17,252
Int. Cl. B29c *1/02*
U.S. Cl. 264—45 6 Claims


PREPARE PATTERN HAVING PARTING FRAME AT PARTING LINE AND SHAPES FOR CONTOURED WALLS ON FACES OF PARTING FRAME
ELECTROFORM ENVELOPE ABOUT PATTERN
PREPARE SURFACES OF ENVELOPE
APPLY STRIPS REPRESENTING HEAT TRANSFER CONDUITS
APPLY HEAT TRANSFER CONDUITS
FLOATINGLY SECURE ENVELOPE TO TWO BOXES
FOAM IN PLACE CELLULAR FOUNDATION
REMOVE PERIPHERY OF PARTING FRAME
SEPARATE BOXES AND REMOVE PATTERN

A pattern for a pair of separable metal molds for a giant plastic article is prepared by a method in which a parting

frame at the location of the contemplated parting line is secured to two sections representing the two parts of the mold. The pattern is immersed in an electrolyte and a metallic envelope is electroformed about the pattern. Insulated protrusions extending from the parting frame are not coated, whereby accurate identification of various zones of the envelope is feasible. Copper is a preferred metal for the major thickness of the electroformed molds, but nickel is desirably first plated onto the pattern and thus is the metal contacting the hot plastic. The surfaces of the envelope are modified to permit construction of heat transfer conduits, desirably by a second stage of electroforming. The periphery of the parting frame is removed, thereby permitting the two portions of the electroform to function as two portions of a mold. Each portion is anchored into a box. A polyurethane foam insulating foundation is positioned between a box wall and a contoured wall of the mold. The relatively thin contoured walls of the electroformed halves of the mold are not readily distorted because they are anchored into their boxes.

3,723,586

PROCESS OF EXTRUDING A FOAMABLE THERMOPLASTIC RESIN

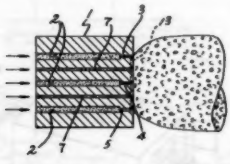
William Rees Foster, Cwmbran, and Stanley John Skinner, Newport, both of England, assignors to Monsanto Chemicals Limited, London, England

Filed May 2, 1968, Ser. No. 726,061

Claims priority, application Great Britain, May 5, 1967, 21,006/67

Int. Cl. B29d *7/04, 27/00*

U.S. Cl. 264—53 **6 Claims**



Dies and processes for extruding a foamable thermoplastic synthetic resin through a plurality of channels and passages extending from the inlet to the outlet end of a die, each of the channels communicating with a network of slits at the outlet end of the die and each of the passages having its outlet substantially in the center of a mesh of the network of slits, at least the majority of the passages having grooves extending from the outlet end of the passage toward the outlet of its surrounding mesh of slits to ensure that a strand of foamed resin extruded from the passage substantially fills the space formed by the enveloping foamed resin issuing from the surrounding mesh of slits.

3,723,587

ELIMINATION OF THE GRINDING OF CALCINED FERRITE IN THE PRODUCTION OF ANISOTROPIC MAGNETS

Keizo Iwase, Shiga-gun; Toshio Takada, Kyoto; Yoshichika Bando, Takatsuki; Masao Kiyama, Kyoto; Itsusaku Naito, Tokyo, and Masao Kazihara, Kawagoe, all of Japan, assignors to Tokyo Shoketsu Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1971, Ser. No. 118,705

Claims priority, application Japan, March 2, 1970, 45/18072

Int. Cl. C04b *35/26, 35/64*

U.S. Cl. 264—61 **12 Claims**

Anisotropic metal oxide magnets are produced by mixing at least one of α-FeOOH having rectangular plate or needle crystal form, α-Fe_2O_3 obtained by thermally decomposing the above described α-FeOOH, Fe_3O_4 obtained by reducing the above described α-Fe_2O_3 and γ-Fe_2O_3 obtained by reoxidizing the above described Fe_3O_4 with at least one of barium compounds, strontium compounds and lead compounds so as to adjust the product composition to be approximately $MO \cdot 6Fe_2OB3$, wherein M is at least one metal of Ba, Sr and Pb, charging the resulting mixture in a press mold and subjecting to a primary compression molding under a pressure of 0.05 to 6 ton/cm², primary sintering the compressed product at a temperature of 300° to 1,150°C, putting the sintered product in a press mold and subjecting to a secondary compression molding in the same direction as in the primary compression molding under a pressure of 0.3 to 10 ton/cm² and secondarily sintering the compressed product at a temperature of 1,050°C to 1,400° C. Optionally, the barium, strontium, or lead compounds can be added either after the first cold pressing step or after the partial sintering step instead of prior to the first cold pressing step.

3,723,588

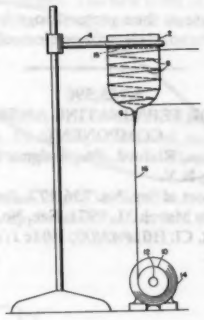
METHOD FOR PRODUCTION OF NOVOLAC FIBERS

James Economy, Eggertsville, N.Y., and Rodger A. Clark, Indianapolis, Ind., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 710,292, March 4, 1968, Pat. No. 3,650,102. This application Nov. 4, 1970, Ser. No. 87,002

Int. Cl. B29c *25/00;* **D01f** *5/12*

U.S. Cl. 264—83 **16 Claims**



A novolac melt is fiberized to produce a thermoplastic, uncured novolac fiber, and the novolac is curved by heating the fiber in a formaldehyde environment in the presence of an acid catalyst to obtain an infusible, cured novolac fiber.

3,723,589

SOLID ELECTROLYTE ELECTROLYTIC CELL

John H. Kennedy, Santa Barbara, Calif., assignor to The Bissett-Berman Corporation, Santa Monica, Calif.

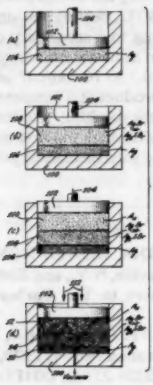
Division of Ser. No. 852,572, Aug. 25, 1969, Pat. No. 3,594,617. This application Feb. 25, 1971, Ser. No. 118,898

Int. Cl. B28 ; B29

U.S. Cl. 264—101 **6 Claims**

An electrolytic cell using a solid electrolyte such as polycrystalline silver bromide or silver sulfide bromide. Also included within the present invention is a method of preparation of the electrolytic cell wherein a first electrode is formed from a powdered active metal such as powdered silver and wherein the powdered silver is lightly compacted to a desired shape. The solid electrolyte is also formed from a powdered substance such as silver bromide or silver sulfide bromide and wherein the solid electrolyte is lightly compacted against the first electrode. A second electrode is formed from a powdered inert metal such as powdered gold and wherein the second

electrode is lightly compacted against the solid electrolyte. The entire structure including the two electrodes sandwiching



the solid electrolyte is then pressed together at a very high pressure to form the solid electrolyte electrolytic cell.

3,723,590

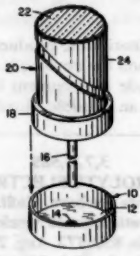
METHOD FOR TERMINATING AN ELECTRICAL COMPONENT

Robert P. Anderson, Rixford, Pa., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 736,172, June 11, 1968. This application March 31, 1971, Ser. No. 129,765

Int. Cl. H01r *43/00*; H01c *1/14*

U.S. Cl. 264—104 **1 Claim**



A method utilizing a cylindrically shaped cup having an apertured bottom through which a lead wire end portion is inserted into the interior thereof. An electrically conductive epoxy, solder, or other bonding material is deposited in the interior of the cup. The end of an electrical component to be terminated is inserted into the bonding material within the cup and held in a fixed position until the material solidifies thereby forming a low resistance bond between the component and the lead wire. After the bonding material has cured the cup is removed from the component by slipping it from the free end of the lead wire.

3,723,591

PROCESS FOR MAKING ARTICLES FROM SULFUR DIOXIDE-CONJUGATED DIOLEFIN-CYCLOPENTADIENE POLYMER

Ronald S. Bauer, Orinda, and Howard V. Holler, Oakland, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Continuation of Ser. No. 742,499, July 5, 1968, abandoned. This application Nov. 6, 1970, Ser. No. 87,585

Int. Cl. C08f *13/06, 27/24, 47/14*

U.S. Cl. 264—237 **2 Claims**

Hydrogenated terpolymers of a linear diolefin such as butadiene, SO_2, and cyclopentadiene are converted by quenching from the melt to non-crystalline articles exhibiting unusually high impact resistance and superior tensile yield strength, heat distortion temperature and processing stability, compared to other hydrogenated terpolymeric polysulfones. The articles tend to retain the impact resistance even if later converted by annealing to a partly crystalline structure.

3,723,592

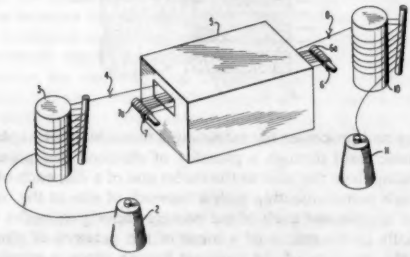
HOT STEPWISE DRAWING OF POLYBENZIMIDAZOLE STRAND MATERIAL WITH INDEPENDENT FREE-WHEELING IDLER ROLLS

Thomas Carl Bohrer, Charlotte, N.C.; George Franklin Ecker, Toms River, N.J., and David Hsiao Tsung Chen, Wilmington, Del., assignors to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 769,893, Oct. 23, 1968, abandoned. This application Nov. 10, 1970, Ser. No. 88,462

Int. Cl. B29c *17/02*; D02j *1/22*

U.S. Cl. 264—290 R **3 Claims**



By using at least three independent, free-wheeling idler rolls, high speed hot drawing of orientable synthetic strand material such as polybenzimidazole yarn is accomplished in a more favorable and improved manner as stepwise drawing is permitted in each of the passes through the heating zone; the strand material being drawn wherever the yield point occurs, rather than at a predetermined location for a fixed amount which might not be optimum.

3,723,593

PROCESS FOR CONTINUOUSLY ANNEALING A FUSED CAST REFRACTORY BODY

Isao Ono, Tokyo, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 67,939, Aug. 28, 1970, abandoned. This application March 31, 1972, Ser. No. 240,304

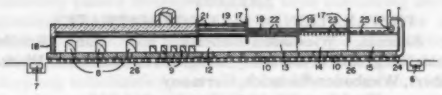
Claims priority, application Japan, Nov. 18, 1969, 44/91792

Int. Cl. C04b *35/60*

U.S. Cl. 264—332 **9 Claims**

A process for continously annealing a fused cast refractory body, in order to obtain a crack-free product, in which the

fused cast refractory body is placed on a suitable preheated carrier which has been previously heated to a temperature of



greater than 500° C in a preheat chamber, and is charged into an annealing tunnel which is divided into a hot zone and a cooling zone having at least one cooling section.

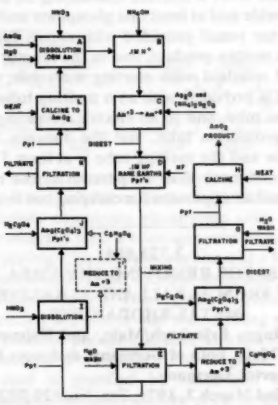
ERRATA

For Classes 423—307 and 423—495 see:
Patents Nos. 3,723,074 and 3,723,075

3,723,594
RARE EARTH REMOVAL FROM AMERICIUM OXIDE

Stephen G. Proctor, Denver, Colo., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed May 18, 1972, Ser. No. 254,687
Int. Cl. C01g *56/00*
U.S. Cl. 423—11 **3 Claims**



Americium oxide materials having rare earths as impurities may have these removed by oxidizing the americium to the hexavalent state, precipitating and removing rare earth values using hydrofluoric acid, reducing the americium to the trivalent state, thereafter precipitating and removing americium oxalate using oxalic acid, and calcining the americium oxalate to americium oxide.

3,723,595
PROCESS FOR RECOVERING VOLATILIZED RHENIUM OXIDES AND SULFUR OXIDES FROM GAS STREAMS

Henry Rush Spedden, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed July 12, 1971, Ser. No. 161,498
Int. Cl. C01g *47/00*
U.S. Cl. 423—50 **13 Claims**

A gas stream containing a silfur oxide and a volatilized rhenium oxide is scrubbed with an aqueous alkaline solution containing ions capable of forming sulfites and bisulfites, e.g., an ammonium or an alkali metal solution, to remove practically all of the sulfur oxide from the gas stream as a soluble sulfite and to dissolve the rhenium oxide in the resulting sulfite solution, which is maintained alkaline for the purpose. The rhenium-bearing sulfite solution is treated by known means, such as ion exchange or solvent extraction, to recover the rhenium oxide contained therein, and the effluent sulfite solution is then employed as the scrubbing solution in a second gas scrubbing stage in which a different sulfur-oxide-containing gas stream, such as the exit gas from a sulfuric acid plant, having substantially no rhenium content, is scrubbed to extract sulfur oxide, making such effluent sulfite solution acid and converting the sulfites into soluble bisulfites. Sulfur values are preferably recovered from the resulting bisulfite solution.

3,723,596
HYDROMAGNESITE HAVING A MODIFIED MORPHOLOGY AND METHOD FOR THE PREPARATION THEREOF

Paul Lecuit, Strombeck-Bever, and Paul Demilie, Brussels, both of Belgium, assignors to Solvay & Cie, Brussels, Belgium

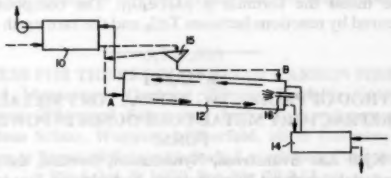
Filed Aug. 27, 1970, Ser. No. 67,518
Claims priority, application France, Aug. 28, 1969, 6929553
Int. Cl. C01f *5/24*
U.S. Cl. 423—430 **8 Claims**

Light hydromagnesite in spherical aggregates of small crystals having a pore volume superior to 4,000 mm.^{3}/g. is provided by precipitating hydromagnesite from an aqueous solution containing a soluble salt of magnesium and an alkali metal carbonate by a double decomposition reaction in the presence of a crystallization-habit modifying agent selected from the alkali metal polyphosphates. The new form of hydromagnesite is useful for the manufacture of thermal insulation products, absorbent and adsorbent agents and especially catalyst supports.

3,723,597
CALCINING PHOSPHATE MINERALS

Francis Dambrine, 59-Marcq en Baroeel, and Gilles Gross, 59-Lille, both of France, assignors to Fives Lille-Gail, Paris, France

Filed Jan. 29, 1971, Ser. No. 110,811
Claims priority, application France, Jan. 23, 1970, 7002404
Int. Cl. F27b *7/02*
U.S. Cl. 423—200 **8 Claims**



In calcining phosphate-containing minerals, the temperature of at least a fraction of the mineral delivered to the calcining kiln is rapidly raised from a temperature lower than the normal exothermic reaction temperature of the mineral material to one in excess thereof.

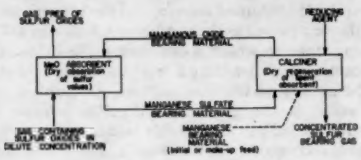
3,723,598
DRY CYCLIC PROCESS UTILIZING A MANGANOUS OXIDE ABSORBENT FOR REMOVAL OF DILUTE SULFUR VALUES FROM GAS STREAMS

Henry Rush Spedden; Kenneth J. Richards, and William J. Schlitt, III, all of Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Nov. 5, 1970, Ser. No. 87,089
Int. Cl. C01b *17/56, 17/60*
U.S. Cl. 423—244 **8 Claims**

Manganous oxide is utilized as a dry absorbent for dilute sulfur values, such as SO_2 and SO_3, in a gas stream of the na-

ture of waste effluent from industrial stacks of smelters, power plants, etc. The resulting manganese sulfate is regenerated to


GAS FREE OF SULFUR OXIDES
REDUCING AGENT
MANGANOUS OXIDE BEARING MATERIAL
MnO ABSORBENT (Dry absorption of sulfur values)
CALCINER (Dry regeneration absorbent)
MANGANESE SULFATE BEARING MATERIAL
GAS CONTAINING SULFUR OXIDES IN DILUTE CONCENTRATION
MANGANESE BEARING MATERIAL (Initial or make-up feed)
CONCENTRATED SULFUR BEARING GAS

provide dry manganous oxide for recycling to the gas stream. Regeneration is effected by dry calcination of the manganese sulfate under reducing conditions.

3,723,599

TECHNIQUE FOR GROWTH OF SINGLE CRYSTAL GALLIUM GARNET

Charles David Brandle, Jr., Somerville, and David Christopher Miller, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 18, 1971, Ser. No. 172,751
Int. Cl. C01f *17/00*
U.S. Cl. 423—263 **9 Claims**

Rare earth gallium garnet crystals evidencing low dislocation densities are obtained by the crystal pulling techniques utilizing an oxygen containing ambient wherein the partial pressure of oxygen ranges from about 3.8–19 millimeters of mercury.

3,723,600

RARE EARTH TELLURITES AND METHOD OF PRODUCING SAME

Michael J. Redman, Belmont, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 878,915, Nov. 21, 1969, abandoned. This application Oct. 18, 1971, Ser. No. 190,267
Int. Cl. C22b *59/00*
U.S. Cl. 423—263 **10 Claims**

Tellurium compounds having the general formula $(A_xB_y)Te_4O_{11}$ where A and B is a rare earth metal or yttrium, x is from 0 to 2, y is from 0 to 2, and x plus y is 2. Where A and B are the same metal the formula is $M_2Te_4O_{11}$. The compounds are prepared by reactions between TeO_2 and the rare earth oxides.

3,723,601

METHOD OF PRODUCING REFRACTORY METALS AND REFRACTORY METAL COMPOUNDS IN POWDER FORM

Elis Kjell Ake Svanstrom, Nynashamn, Sweden, assignor to Rederiaktiebolaget Nordstjornan, Nynashamn, Sweden

Filed May 21, 1971, Ser. No. 145,922
Claims priority, application Sweden, May 27, 1970, 7275/70
Int. Cl. C01b *31/30*; C22c *29/00*; C01b *21/06*
U.S. Cl. 423—297 **13 Claims**

Refractory metals and refractory metal compounds are produced using a gaseous halide process in which the process is accelerated by employing crystallization seeds in the reaction.

3,723,602

PHOSPHATE COMPOSITIONS AND METHODS OF MANUFACTURE

Norman Earl Stahlheber, Columbia, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 729,384, May 15, 1968, abandoned. This application March 8, 1971, Ser. No. 122,115
Int. Cl. C01b *15/16, 25/26*
U.S. Cl. 423—305 **7 Claims**

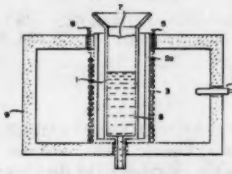
A novel crystalline potassium polyphosphate hydrate and a method for its manufacture are disclosed. The new polyphosphate is useful in compounding slowly soluble fertilizer compositions.

3,723,603

PREPARATION OF FLUOROPHOSPHATES

Uwe Skurnia, Wiesbaden-Biebrich, and Hans Rohlfs, Heidelberg, both of Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

Filed Sept. 29, 1969, Ser. No. 861,732
Claims priority, application Germany, Sept. 28, 1968, P 17 92 648.6
Int. Cl. C01b *25/00*; C01d *11/00*
U.S. Cl. 423—307 **8 Claims**



A process for the continuous production of an alkali metal fluorophosphate from a mixture containing an anhydrous alkali metal fluoride and at least one phosphate and feeding it to a heated reactor vessel provided with means for continuous discharge of a molten product, and in the reactor vessel being a molten bed overlaid with starting materials, wherein the reactor vessel is provided with a) a melting tube surrounded by a protection tube, and)b an electrical heating element for heating said protection tube, and the distance between the protection tube and the melting tube is at least 5 and at most 300 mm and not more than 60 percent of the radius of the melting tube and an apparatus for carrying out this process.

3,723,604

PROCESS FOR REMOVING THIOUREA AS AN IMPURITY FROM ALKALI-AND ALKALINE EARTH-METAL RHODANIDES

Hans-Dieter Rupp, Erlenbach/Main, and Helmut Magerlein, Obernburg/Main, both of Germany, assignors to Glanzstaff A.G., Wuppertal, Germany

Filed March 3, 1971, Ser. No. 120,702
Claims priority, application Germany, March 5, 1970, P 20 10 278.7
Int. Cl. C01c *3/20*; C07c *127/00*
U.S. Cl. 423—366 **10 Claims**

Process for removing thiourea as an impurity from a crude alkali- or alkaline earth- metal rhodanide wherein an aqueous solution of the impure or crude rhodanide containing the thiourea is heated at certain elevated temperatures and in the presence of copper (II) oxide, preferably with an excess of the oxide with reference to a stoichiometric molar amount of the thiourea. Very pure rhodanides substantially free of thiourea are known to be useful in the manufacture of thiocyanates, especially organic thiocyanates, among other uses.

3,723,605

PROCESS FOR THE PRODUCTION OF A CONTINUOUS LENGTH OF GRAPHITIC FIBROUS MATERIAL

Michael J. Ram, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 10, 1970, Ser. No. 45,161
Int. Cl. C01b *31/04, 31/07*
U.S. Cl. 423—447 **22 Claims**

An improved process is provided for the production of a continuous length of a graphitic fibrous material through the

catalysis of the graphitization reaction. A continuous length of fibrous material capable of undergoing graphitization which is essentially free of boron at the time of its introduction is continuously passed through a heating zone containing an inert gaseous atmosphere having a maximum temperature of at least about 2,000°C. bounded by walls of graphitic carbon in intimate association with a boron compound capable of undergoing volatilization at a temperature below about 2,000°C. thereby enabling the volatilization of a catalytic quality of boron capable of catalyzing the graphitization of the fibrous material within the heating zone.

3,723,606

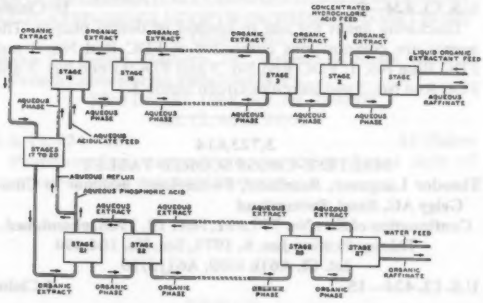
PRODUCTION OF PHOSPHORIC ACID

William Christian Klingelhoefer, Hopewell, and James Earl Sansing, Jr., Chester, both of Ill., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 716,788, March 28, 1968, abandoned. This application Dec. 21, 1970, Ser. No. 100,367

Int. Cl. C01b *25/16*

U.S. Cl. 423—321 **1 Claim**



Phosphate rock is reacted with hydrochloric acid in the presence of a water-soluble sodium compound to produce an aqueous acidulate containing phosphoric acid. The aqueous acidulate is extracted with a homogeneous organic liquid extractant comprising a liquid hydrocarbon and a low molecular weight, acidulate-immiscible alcohol to produce an organic solution of phosphoric acid. The organic solution of phosphoric acid is extracted with water and the resulting extract is concentrated to produce phosphoric acid which is low in calcium chloride content. Preferably, the organic solution of phosphoric acid is purified by extraction with aqueous phosphoric acid to remove calcium prior to extraction with water. The product phosphoric acid contains only 0.05–0.5 part by weight of calcium per 100 parts by weight of phosphoric acid, measured as P_2O_5, and is particularly useful in production of stable fertilizer solutions.

3,723,607

SURFACE MODIFICATION OF CARBON FIBERS

Ilmar L. Kalnin, Millington, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,562

Int. Cl. C01b *31/07*

U.S. Cl. 423—447 **17 Claims**

A process is provided for modifying the surface characteristics of a carbonaceous fibrous material (either amorphous carbon or graphitic carbon) and to thereby facilitate enhanced adhesion between the fibrous material and a resinous matrix material. The fibrous material is initially heat treated in an inert gaseous atmosphere, and is subsequently heated in a gaseous atmosphere which includes a substantial quantity of ozone under conditions found capable of producing the desired surface modification. Composite articles of enhanced interlaminar shear strength are formed by incorporating the fibers modified in accordance with the present process in a resinous matrix material.

3,723,608

PRODUCTION OF PHOSPHORUS

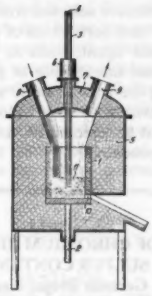
Peter Lorenz Meurer, Herdecke-Ende; Friedrich Wilhelm Dorn, Hermulheim, and Heinz Harnisch, Lovenich, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Filed Feb. 17, 1971, Ser. No. 116,167

Claims priority, application Germany, March 24, 1970, P 20 14 014.1

Int. Cl. C01b *25/02*

U.S. Cl. 423—322 **5 Claims**



Production of phosphorus by reaction of a mixture comprising calcium phosphate, quartz sand and coke. The reaction is effected at 1,300° to 1,700° C by electrical heating in an autogenous bed of fluidized coke. The coke is used in particles with a size of 0.1 to 5 mm, and each of the calcium phosphate, quartz sand and coke components forming the mixture is used in particles with a size of 0.01 to 5 mm. The reduction furnace used in carrying out this process is comprised of a carbon furnace vessel which is fitted with at least one movable electrode projecting into it from above, a refractory heat insulation encapsulating the furnace vessel, at least one raw material inlet, at least one outlet for removal of furnace gas containing phosphorus and carbon monoxide, at least one tapping hole in the bottom portion of the vessel and the heat insulation encapsulating the vessel, for tapping off slag and ferrophosphorus.

3,723,609

PROCESS FOR THE PRODUCTION OF CARBON FIBERS

Manfred Mansmann; Gerhard Winter, Krefeld; Gottfried Pampus; Hildegard Schnoring, both of Leverkusen, and Nikolaus Schon, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 7, 1970, Ser. No. 78,943

Claims priority, application Germany, Oct. 17, 1969, P 19 52 388.7

Int. Cl. C01b *31/07*

U.S. Cl. 423—447 **16 Claims**

In the production of carbon fibers wherein a carbon-containing fiber-forming material is spun as a solution, the spun-filaments are converted to solid fibrous material, and the fibrous material is carbonized, the improvement which comprises including in said solution at least one fiber-forming high polymer at a concentration of about 0.001 to 10 percent by weight and a greater amount of a carbon source comprising at least one carbon-containing organic material having a softening or melting point in excess of about 80° C., whereby the solution of said carbon containing material is rendered spinnable by addition of said fiber-forming high polymer, said carbon containing organic material serving as the source of carbon for the carbon fiber; the fiber may thereafter be graphitized. The spinning solution used for fiber production is preferably a solution in a volatile solvent so that it may be dry spun. The carbon source in said solvent by itself would not be spinnable and may be a monomer or low polymer.

3,723,610

PROCESS FOR MAKING CARBON ARTICLES

Walter Fischer, and Joseph Heckmaier, both of Burghausen-Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Germany

Continuation of Ser. No. 747,443, July 25, 1968, abandoned. This application Feb. 19, 1971, Ser. No. 117,047

Claims priority, application Germany, July 26, 1967, W 44 447

Int. Cl. C01b *31/02, 31/07*

U.S. Cl. 423—447 4 Claims

Process for making carbon filaments, foils, threads, fibers, fabrics and similar formed bodies which comprises treating such a body composed of a copolymerizate of vinyl chloride and at least one substance selected from the group consisting of polyvinyl alcohol and derivatives of polyvinyl alcohol with an acid condensation agent, such as concentrated sulfuric acid, until it becomes unmeltable at pyrolysis temperatures and then subjecting the treated body to pyrolysis. A formed body of a copolymerizate of vinyl chloride and vinyl acetate which contains 40 to 95 percent of vinyl chloride is particularly suitable in the process.

3,723,611

PRODUCTION OF CHROMIUM (III) OXIDE OF LOW SULFUR CONTENT

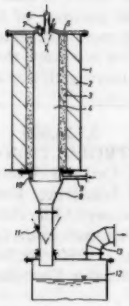
Volker Hahnkamm; German Broja; Karl Brandle, and Claus-Heinrich Elstermann, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 14, 1971, Ser. No. 152,768

Claims priority, application Germany, June 20, 1970, P 20 30 510.6

Int. Cl. C01g *37/02*; B01j *1/00*

U.S. Cl. 423—607 11 Claims



Chromium (III) oxide is prepared by contacting a finely divided alkali metal chromate with hydrogen at a temperature of about 900° to 1,600° C. The reaction product is cooled with liquid to produce a dispersion of Cr_2O_3 in water. If the dispersion is kept alkaline the Cr_2O_3 when separated contains less than 0.005 percent of sulfur. The initial chromate should be finely divided, e.g., less than 500μ or dissolved, and an acid-forming gas such as chlorine or hydrogen chloride can also be included to form a salt with the by-product alkali metal oxide.

ERRATUM

For Class 423—175 see:
Patent No. 3,722,867

3,723,612

STABILIZER FOR RADIOACTIVE COLLOIDAL SOLUTIONS

Nikolai Borisovich Mikheev; Maia Arkadievna Gracheva, both of Moscow; Ljubov Grigorievna Bogomolova, Leningrad, and Valentin Ilich Levin, Moscow, all of U.S.S.R., assignors to Institut Biofiziki, Moscow, U.S.S.R.

Filed Aug. 8, 1969, Ser. No. 848,714

Int. Cl. A61k *27/04*

U.S. Cl. 424—1 7 Claims

A stabilizer for radioactive colloidal solutions prepared from three gelatin fractions of varying molecular weights. It is prepared by heating the fractions with water, sodium chloride and succinic anhydride followed by neutralization and bacterial filtration.

3,723,613

DENTAL PLAQUE DISCLOSING AGENT

Philip L. Block, 416 Deerfield Dr., Moraga, Calif., and John P. Derdivanis, 6284 Crown Ave., Oakland, Calif.

Filed Jan. 22, 1971, Ser. No. 109,054

Int. Cl. G01n *31/00, 33/16*

U.S. Cl. 424—7 10 Claims

Disclosing agent for use in control of dental plaque. The agents are compositions comprises of FDC Red No. 3 and FDC Blue No. 1; FDC Red No. 3 and FDC Green No. 3 and FDC Red No. 3 and Hercules Green Shade 3.

3,723,614

MALTESE-CROSS SCORED TABLET

Theodor Langauer, Baselland, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 777,091, Nov. 19, 1968, abandoned. This application Jan. 6, 1971, Ser. No. 104,494

Int. Cl. A61k *9/00*; A61j *3/10*

U.S. Cl. 424—15 1 Claim

A tablet having a breaker-score assuring accurate and easy breakage into predetermined portions.

3,723,615

FUMIGANT INSECTICIDAL MIXTURES OF D-CHRYSANTHEMATES

Yositosi Okuno, Toyonaka, Japan, assignor to Sumitomi Chemical Company, Limited, Osaka, Japan

Filed Dec. 15, 1970, Ser. No. 98,357

Claims priority, application Japan, Dec. 24, 1969, 45/1007

Int. Cl. A01n *9/28, 17/00, 17/04*

U.S. Cl. 424—18 4 Claims

dl-2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl novel insecticidal composition in the form of a fumigant which contains as 44/1007 active ingredient a mixture of di-2-allyl-3-methyl-cyclopent-2-ene-1-one-4-yl dl-cis,trans-chrysanthemate and 5-benzyl-3-furylmethyl-dl-cis,trans-chrysanthemate, or 5-benzyl-3-furylmethyl-d-trans-chrysanthemate, which has a rapid knock down effect on injurious insects such as mosquitoes and an effect to delay the recovery of knocked-down injurious insects, and is useful for sanitary, agricultural and horticultural purposes.

3,723,616

HAIR SPRAY CONTAINING VINYL ESTER-ESTER OF α,β-UNSATURATED MONO-OR DICARBOXYLIC ACID COPOLYMER

Gustav Erlemann, Basel, Switzerland; Manfred Sander, and Gerhard Zimmer, both of Kelkheim, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 652,408, July 11, 1967, abandoned. This application Feb. 27, 1970, Ser. No. 15,258

Claims priority, application Switzerland, July 29, 1966, 11014/66

Int. Cl. A61k 7/10

U.S. Cl. 424—47 1 Claim

Hair sprays containing film forming copolymers of (a) vinyl esters; (b) monoesters of aliphatic olefinically unsaturated mono- or dicarboxylic acids with lower alkanediols, and where required; and (c) α,β-unsaturated carboxylic acids are disclosed.

3,723,617

ANTI-INFLAMMATORY COMPOSITIONS CONTAINING ACYLATED-β-D-GLUCOPYRANOSIDES AND METHODS OF USING THEM

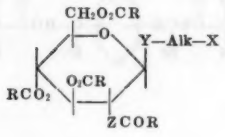
Blaine M. Sutton, Hatboro, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Dec. 31, 1968, Ser. No. 789,000

Int. Cl. A61k 27/00

U.S. Cl. 424—180 11 Claims

Pharmaceutical compositions containing dosage units of compounds of the structural formula:



wherein X is halo, carbalkoxy to five carbons, acyloxy to five carbons, acylamido to five carbons, acylmercapto to five carbons, or aromatic hydrocarbons oxy to 10 carbons; Y is sulfur or oxygen; Z is —NH— or oxygen; R's are one of aryl to eight carbons; alkyl to five carbons; and Alk is straight or branched chain alkyl up to five carbons, which may be substituted by alkyl, acyloxy or acylamido, as limited in defining X above.

3,723,618

SYNERGISTIC FUNGICIDAL COMPOSITION FOR THE CONTROL OF DISEASES OF RICE PLANTS

Yasuo Yamada, Tokyo, Japan, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 17, 1970, Ser. No. 90,466

Claims priority, application Japan, Nov. 24, 1969, 44/93773

Int. Cl. A01n 9/02, 9/28, 9/36

U.S. Cl. 424—225 10 Claims

Fungicidal compositions in the form of synergistic combinations of 4,5,6,7-tetrachlorophthalide and O-(ethyl, n-propyl or isopropyl)-S,S-diphenylphosphorodithiolate which are individually known compounds, which combinations possess synergistic fungicidal properties especially for the control of diseases of rice plants.

3,723,619

DIURETIC AND SALURETIC COMPOSITIONS AND METHOD WITH 3-TERTIARY AMINO PROPIONYL-BENZOFURAN-2-CARBOXYLIC ACIDS

Janos Zergenyi, Riehen, and Ernst Habicht, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 746,268, July 22, 1968, Pat. No. 3,574,208. This application Nov. 18, 1970, Ser. No. 90,818

Claims priority, application Switzerland, July 28, 1967, 10765/67; Sept. 29, 1967, 13638/67

Int. Cl. A61k 27/00

U.S. Cl. 424—248 10 Claims

5-(2-Di(lower)alkylaminomethyl-(lower)alkanoyl)-benzofuran-2-carboxylic acids and their pharmaceutically acceptable salts with acids and bases are prepared by Mannich condensation of 5-lower-alkanoyl-substituted benzofuran-2-carboxylic acids with paraform-aldehyde and secondary amines. A typical embodiment is 5-(2-dimethylaminomethyl-butyryl)-6-methyl-benzofuran-2-carboxylic acid hydrochloride. A method of producing a diuretic and a saluretic effect comprising administration of said compounds to warm-blooded animals as well as pharmaceutical compositions containing said compounds are provided.

3,723,620

3-SUBSTITUTED AMINO-6-HYDRAZINO PYRIDAZINES AS HYPOTENSIVES

Paul L. Anderson, Dover; William J. Houlihan, and Robert E. Manning, both of Mountain Lakes, all of N.J., assignors to Sandoz Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 792,764, Jan. 21, 1969, Pat. No. 3,598,822. This application Feb. 22, 1971, Ser. No. 117,752

Int. Cl. A61k 27/00

U.S. Cl. 424—250 15 Claims

Certain 3-alkenyl substituted amino-6-hydrazino pyridazines have been found to be useful as hypotensive/antihypertensive agents and as anorexics.

3,723,621

N,N'-BIS-(ETHYLENE)-4,4'-BIPIPERIDYL DICHLORIDE GROWTH PROMOTING COMPOUND AND METHOD OF USING SAME

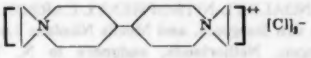
Robert J. Rutman, Philadelphia, Pa., assignor to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 838,641, July 2, 1969, Pat. No. 3,575,987, which is a continuation-in-part of Ser. No. 540,498, April 6, 1966, abandoned. This application March 2, 1970, Ser. No. 20,264

Int. Cl. A61k 27/00

U.S. Cl. 424—267 5 Claims

The novel compound N,N'-bis-(ethylene)-4,4'-bipiperidyl dichloride is provided which is represented by the formula



The compound of this invention is especially useful for promoting the growth of vertebrate animals.

3,723,622

FUNGICIDAL COMPOSITION AND METHODS OF KILLING FUNGI USING 1-TRITYL-1,2,4-TRIAZOLES

Karl Heinz Buchel, Wuppertal-Elberfeld; Ferdinand Grewe, and Helmut Kospers, both of Leverkusen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 848,738, Aug. 8, 1969, Pat. No. 3,682,950. This application April 19, 1972, Ser. No. 245,603

Claims priority, application Germany, Aug. 28, 1968, P 17 95 249.7

Int. Cl. A01n 9/00, 9/22

U.S. Cl. 424—269 12 Claims

1-Trityl-1,2,4-triazoles, i.e. 1-[(optionally mono and di chloro-, fluoro-, cyano- and trifluoromethyl- substituted)-(optionally mono and di chloro-, fluoro-, cyano- and trifluoromethyl- substituted)-(optionally mono and di chloro-, fluoro-, cyano- and trifluoromethyl- substituted)-trityl]-3-(optionally chloro substituted)-5-(optionally chloro substituted)-1,2,4-triazoles, or 1-[(optionally mono and di chloro, fluoro-, cyano- and trifluoromethyl- substituted phenyl)-(optionally mono and di chloro-, fluoro-, cyano- and trifluoromethyl- substituted phenyl)-(optionally mono and di chloro-, fluoro-, cyano- and trifluoromethyl- substituted phenyl)-methyl]-3-(optionally chloro-substituted)-5-(optionally chloro substituted)-1,2,4-triazoles, possess fungicidal properties.

3,723,623

METHOD FOR CONTROLLING OBESITY

Oscar Neal Miller, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 92,294, Nov. 23, 1970, abandoned. This application June 5, 1972, Ser. No. 259,709

Int. Cl. A61k 27/00

U.S. Cl. 424—266 3 Claims

A method of utilizing 2,6-dihydroxynicotinic acid as an agent for inhibiting the synthesis of lipids and, consequently, reducing the weight of accumulated fat in warm-blooded animals, is described.

3,723,624

2-HYDROXY AND 2-CARBAMYLOXY DERIVATIVES OF 1,1,1-TRICHLORO-3-CARBAMYLOXYALKANES IN A COMPOSITION AND METHOD FOR EFFECTING MUSCLE RELAXATION

Laszlo L. Darko, Yorktown Heights, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 25,282, April 2, 1970, Pat. No. 3,639,453, which is a continuation-in-part of Ser. No. 786,750, Dec. 24, 1968, abandoned. This application June 29, 1970, Ser. No. 158,112

Int. Cl. A61k 27/00

U.S. Cl. 424—300 2 Claims

1,1,1-Trichloro-2-HYDROXY-3-carbamyloxyalkanes and their 2-carbamyloxy derivatives such as 1,1,1-trichloro-2-hydroxy-3-carbamyloxypropane, 1,1,1-trichloro-2-hydroxy-3-carbamyloxybutane and 1,1,1-trichloro-2,3-dicarbamyloxybutane are depressants of the central nervous system and useful as muscle relaxants.

3,723,625

PROCESS FOR KILLING PLANT PESTS USING CYANOALKYL-NITROPHENYL CARBONATES

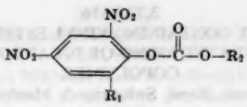
Krijn Van den Boogaart, and Meelis Nicolaus Louis, both of Vlaardingen, Netherlands, assignors to N. V. Fabriek Van Chemische Producten Vondelingenplaat, Rotterdam, Netherlands

Division of Ser. No. 710,630, March 5, 1968, Pat. No. 3,594,400. This application March 26, 1971, Ser. No. 128,525

Int. Cl. A01n 9/12

U.S. Cl. 424—301 3 Claims

Compounds of structure



where R_1 is alkyl of one to 10 carbon atoms, and R_2 is cyanoalkyl containing from one to four carbon atoms in the alkyl group. These compounds are extremely effective as acaricides and also have fungicidal and herbicidal activity.

3,723,626

FUNGICIDAL AND BACTERICIDAL COMPOSITIONS AND METHOD OF KILLING BACTERIA AND FUNGI USING SUBSTITUTED BIS (BROMOACETOXY) XYLENES

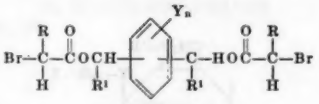
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Division of Ser. No. 853,973, Aug., 1969, Pat. No. 3,681,439. This application May 15, 1972, Ser. No. 253,097

Int. Cl. A01n 9/24

U.S. Cl. 424—311 9 Claims

Compounds having the formula



in which R is hydrogen or cyano and R^1 is hydrogen or methyl, Y is H, lower alkyl or halo, n is a whole integer of from 1 to 4, and the use of these compounds as biocides such as in controlling fungi and bacteria.

3,723,627

SULFAMOYL AZIDE COMPOSITION AND PROCESS FOR LOWERING BLOOD PRESSURE

William L. Matier, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed March 5, 1970, Ser. No. 16,933

Int. Cl. A61k 27/00

U.S. Cl. 424—321 28 Claims

This invention is concerned with a pharmaceutical process and pharmaceutical compositions for lowering blood pressure in mammals by the administration thereto sulfamoyl azides of the Formula $R^1R^2NSO_2N_3$ and pharmaceutical compositions thereof. R^1 is alkyl, cycloalkyl, aryl, aralkyl and so on; R^2 is hydrogen, alkyl, cycloalkyl, phenyl, phenylalkyl, and so on; R^1 and R^2 can be taken together with nitrogen to form a heterocyclic radical.

3,723,628
(N-TRIHALOMETHYLTHIO-N-TRIFLUOROMETHYL-AMINO)-BENZAMIDES AS FUNGICIDAL AGENTS

Hans Scheinpflug, Leverkusen; Engelbert Kuhle, Berg. Gladbach; Erich Klauke, Cologne-Flittard; Paul-Ernst Frohberger, Leverkusen, and Ferdinand Grewe, Burscheild, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 10,299, Feb. 10, 1970, Pat. No. 3,597,480, which is a continuation-in-part of Ser. No. 666,918, Sept. 11, 1967, abandoned. This application Feb. 18, 1971, Ser. No. 116,591

Claims priority, application Germany, Sept. 15, 1966, F 50206

Int. Cl. A01n 9/20

U.S. Cl. 424—324 17 Claims

(N-trihalomethylthio-N-trifluoromethyl-amino)-benzamides which possess fungicidal properties and which may be produced by reacting the corresponding fluorocarbonyl-N-trihalomethylthio-N-trifluoromethyl-anilines, in the presence of an acid-binding agent, with amines.

3,723,629
1-METHOXY-3-H-PERFLUOROBUTANE AS AN INHALATION ANESTHETIC AGENT

George L. Moore, South Plainfield, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed Aug. 2, 1971, Ser. No. 168,380

Int. Cl. A61k 27/00

U.S. Cl. 424—342 2 Claims

2-Methoxy-3-hydroperfluorobutane of the formula

$$CF_3-\underset{\displaystyle OCH_3}{\underset{|}{CF}}-CHF-CF_3$$

is useful as an inhalation analgesic and anesthetic.

ELECTRICAL

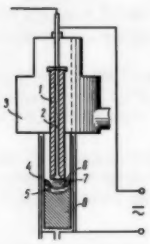
3,723,630
METHOD FOR THE PLASMA-AC REMELTING OF A CONSUMABLE METAL BAR IN A CONTROLLED ATMOSPHERE

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21, Kiev; Alexandr Ivanovich Tselikov, ulitsa Chernyakhovskogo, 40, kv. 54, Moscow; Viktor Iosifovich Lakomsky, ulitsa Bastionnaya, 10, kv. 30, Kiev; Georgy Mikhailovich Grigorenko, ulitsa Frolovskaya, 1, kv. 5, Kiev; Oleg Semenovich Zabarilo, ulitsa Chapaeva, 2/16, kv. 3, Kiev; Gary Alexandrovich Melnik, ulitsa Prazhskaya, 3, kv. 169, Kiev; Nikolai Alexeevich Ponomarev, ulitsa Truda, 34, kv. 18, Izhevsk; Emily Vladimirovich Verkhovtsev, ulitsa Orzhonikidze, 28, kv. 9, Izhevsk, and Sergei Panteleevich Bakumenko, ulitsa Sovetskaya, 21, kv. 17, Izhevsk, all of U.S.S.R.

Filed June 28, 1971, Ser. No. 157,262

Int. Cl. H05b *7/00, 7/18*

U.S. Cl. 13—1 **2 Claims**



A method for plasma-arc remelting of a material under a controlled atmosphere consists in making the material to be remelted in the form of a consumable hollow electrode-bar and electrically melting down the hollow electrode-bar so formed, in a cooled mold before finally stripping the remelted ingot off the mold. The method also includes generating a low temperature plasma at a tip of the consumable electrode which is connected to a power source, by supplying plasma-generating gas into an arc-region, through the hollow of the consumable electrode bar. Stabilizing the plasma-arc during operation without giving rise to transient arc plasma is expediently achieved by feeding preselected amounts of flux into the arc-region, thereby producing an ingot free from flaws and impurities.

3,723,631
SKULL MELTING FURNACE WITH REMOVABLE BOTTOM AND PROCESS FOR FURNACE OPERATION

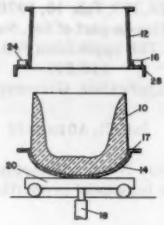
Paul Cichy, Buffalo, and Robert O. Anderson, Akron, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,221

Int. Cl. F27d *1/00*

U.S. Cl. 13—9 **7 Claims**

For an improved method of operation, an arc furnace for skull melting refractory materials is constructed with an outer metal shell having upper and lower sections. The lower section may be removed to permit the easy removal of one refractory



skull and insertion of another without a prolonged furnace shutdown period.

3,723,632
WATER COOLING SYSTEM FOR VACUUM ARC FURNACE

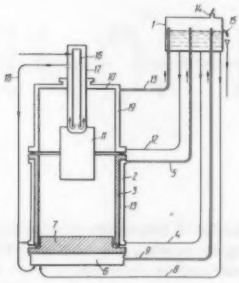
Semen Moiseevich Belzerov, ulitsa Bolshaya Akademicheskaya, 73, Korpus 2, kv. 72, Moscow, U.S.S.R.

Filed March 9, 1972, Ser. No. 233,145

Claims priority, application U.S.S.R., March 17, 1971, 1628322

Int. Cl. H05b *7/02*; **F27d** *9/00*

U.S. Cl. 13—32 **2 Claims**



The cooling system is connected with a main for continuous cooling water supply coupled to an electrode holder cooling pipeline.

After cooling the electrode holder, water is fed into the cooling spaces of a mould and of a bottom plate.

The cooling system is provided with a reserve vessel which is connected by pipelines with the cooling spaces of the electrode chamber, mould and bottom plate of the furnace.

3,723,633
BASS TONE PRODUCING DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 13, 1972, Ser. No. 262,229

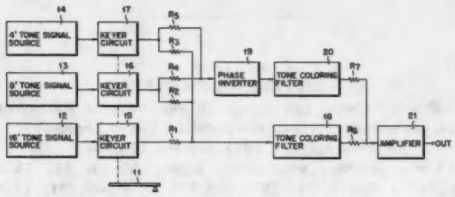
Claims priority, application Japan, June 16, 1971, 46/43111; June 16, 1971, 46/43112

Int. Cl. G10h *1/06, 5/12*

U.S. Cl. 84—1.01 **11 Claims**

In a keyboard electronic musical instrument having pedal keys, a bass tone producing device comprises a fundamental bass tone signal source for generating 16′ bass tone signals

having predetermined pitches for the respective pedal keys, and two harmonic bass tone signal sources for respectively generating 8′ and 4′ bass tone signals. Output signals from the three bass tone signal sources are respectively supplied to three keyer circuits which are gang operated by a pedal key to be rendered conductive upon depression thereof. On the one hand, the three different bass tone signals obtained through the keyer circuits are mixed in a predetermined ratio and supplied to a tone coloring filter having a peak frequency of about **100** to **300** Hz to establish a first composite signal. On the other hand, the two harmonic bass tone signals are mixed in a predetermined ratio, passed through a phase inverter, and applied to another tone coloring filter having a peak frequency of about **1,000** Hz to establish a second composite signal.



Both of the composite signals are finally mixed to form desired bass tones having clear harmonic components.

3,723,634

CRYOGENIC CABLE AND PROCESS FOR MAKING THE SAME

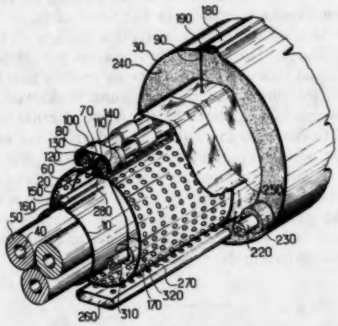
Marcel Aupoix, Paris, and Francois Moisson-Franckhauser, Bretigny-sur-Orge, both of France, assignors to Compagnie Generale D'Electricite and L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed March 6, 1972, Ser. No. 232,163

Claims priority, application France, March 4, 1971, 7107527

Int. Cl. H01v *11/00*

U.S. Cl. 174—15 C **13 Claims**



A cryogenic cable including an internal cylindrical fluid-tight enclosure containing electrical conductors and carrying a cryogenic fluid. A thermal screen surrounds this enclosure, which is equipped with cooling conduits or ducts enveloped in the turned-out edges of the screen. An external enclosure surrounds the internal enclosure and the screen. The enclosures are formed by longitudinally folding a continuous metal strip and securing the edges which are then sealed by a welding joint. The construction thereof as well as that of the screen is performed at the place or location where the cable is to be laid.

3,723,635

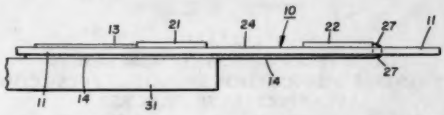
DOUBLE-SIDED FLEXIBLE CIRCUIT ASSEMBLY AND METHOD OF MANUFACTURE THEREFOR

George T. Smith, Reynoldsburg, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,000

Int. Cl. H05k *1/00*

U.S. Cl. 174—68.5 **12 Claims**



Double-sided flexible printed circuits are formed with two sets of precious metal-plated terminals, each set being associated with a different circuit side of the flexible substrate and both sets initially being formed on the same side thereof. The two sets of terminals are initially positioned in two laterally disposed arrays along one edge region of the substrate, with each set being separated by a distance sufficient to allow the resulting substrate region therebetween without terminals to be bent around and secured to a rigid terminal support member. As thus fabricated, the two sets of terminals are positioned to overlie each other on opposite sides of the support member so as to allow access thereto by conventional female connectors, such as the double-row card type.

3,723,636

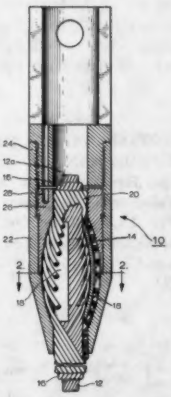
APPLIANCE FOR LINEAR BODIES

Robert A. Eucker, Brooklyn, Ohio, assignor to Preformed Line Products Co., Cleveland, Ohio

Filed July 14, 1972, Ser. No. 271,707

Int. Cl. F16g *11/04*

U.S. Cl. 174—70 R **12 Claims**



The disclosed termination appliance for a load bearing cable or the like is particularly suited to extraordinarily high load applications. The appliance comprises a first egg-shaped protuberance defining member secured to the cable by helically preformed elements wrapped in tightly encircling relation about the member and extending in gripping relation along the cable in opposite directions therefrom. A second member of a conforming contour is applied in overlying relation to the first member and a second set of helically preformed elements are applied in encircling overlying and gripping relation to the second member and the first set of helical elements to further enlarge the protuberance. The described sub-assembly is situated within a housing having contoured sidewalls for conformably seating the enlarged

protuberance and a narrowed aperture for passing the cable. The concentric protuberance structures cooperate to share the load on the cable. Other features are disclosed.

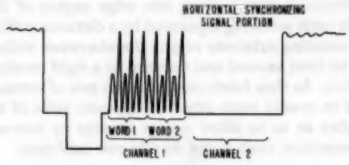
ERRATUM

For Class 176—1 see:
Patent No. 3,723,703

3,723,637
COLOR TELEVISION SYSTEM INCLUDING ADDITIONAL INFORMATION SIGNALS IN PULSE CODE ON A SPECIAL COLOR BURST

Takashi Fujio, and Taro Komoto, both of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,312
Claims priority, application Japan, May 22, 1969, 44/39449
Int. Cl. H04n *9/02*
U.S. Cl. 178—5.2 R **6 Claims**

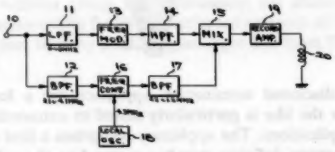


A multiple transmission system of one or more information signals on a color television signal, wherein at least one information signal, such as a voice signal, is sampled and coded to form a coded digital signal representing the information signal. The coded digital signal consists of pulses having a bit frequency and a phase identical with the frequency and the phase of the color burst signal of the color television signal. Successive sample values of said coded digital signal are transmitted during the period of the horizontal blanking signal of the color television signal with the phase of the color burst signal so that the superposed coded digital signal represents also the information of the color burst signal.

3,723,638
COLOR VIDEO SIGNAL RECORDING AND REPRODUCING SYSTEM

Mitsuo Fujita, Tokyo, Japan, assignor to Victor Company of Japan, Limited, Yokohama City, Japan

Filed Feb. 18, 1970, Ser. No. 12,301
Claims priority, application Japan, Feb. 21, 1970, 45/12554
Int. Cl. H04n *9/02, 5/78*
U.S. Cl. 178—5.4 CD **5 Claims**

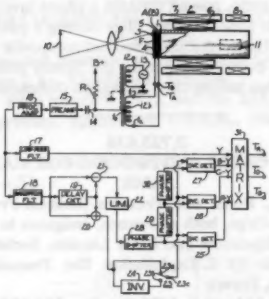


The invention provides a color video signal recording and reproducing system in which a luminance signal of a color video signal is frequency modulated. A carrier chroma signal is frequency converted, its frequency band is reduced to a low level. The frequency modulated luminance signal and frequency converted carrier chroma signal are then superimposed one on the other and applied to rotary magnetic heads of the video tape recorder. The frequency converted carrier chroma signal and frequency modulated luminance signal are separated from the signal reproduced from the magnetic medium. The frequency modulated luminance signal is then frequency demodulated to provide a luminance signal. The carrier chroma signal is frequency converted to provide a carrier chroma signal from which a timing axis variation is removed. The information on the timing axis variation is obtained from the color burst signal or horizontal synchronizing signal.

3,723,639
COLOR TELEVISION CAMERA

Yasuharu Kubota, and Ryuji Shiono, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 31, 1971, Ser. No. 176,554
Claims priority, application Japan, March 31, 1970, 45/27614; March 31, 1970, 45/27615; March 31, 1970, 45/27616; Sept. 1, 1970, 45/76518
Int. Cl. H04n *9/06*
U.S. Cl. 178—5.4 ST **7 Claims**



A color television camera utilizing a vidicon tube that has a filter in the form of alternate stripes for the primary colors red, green, and blue, electrodes for each set of three stripes and a photoconductive layer. An alternating voltage is applied to the electrodes to provide a predetermined pattern on the surface of the photoconductive layer in the form of an index signal which overlaps on the photoconductive layer with the image to be reproduced. The composite signal on the photoconductive layer of an index signal and a color video signal including luminance and chrominance components is derived from the same terminals that applied the reference alternating voltage to the electrodes, and the signals thus derived are connected to a circuit which separates the color video signal from the index signal. The index signal is then applied to three demodulators to obtain the color video signals. Means are provided to reverse the phase of the chrominance components on alternate lines or in another suitable order to avoid bright and dark vertical stripes in the reproduced image.

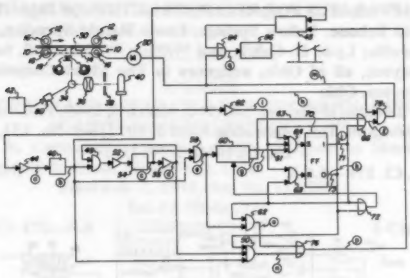
3,723,640
METHOD AND APPARATUS FOR RAPIDLY SCANNING A DOCUMENT

Donald A. Perreault, Pittsford, N.Y., assignor to Xerox Corporation, Stanford, Conn.

Filed June 19, 1970, Ser. No. 47,853
Int. Cl. H04n *7/12*
U.S. Cl. 178—6 **13 Claims**

A facsimile system wherein each elemental line of an object is scanned rapidly. Lines bearing low resolution information are scanned rapidly once, video and step command signals being transmitted at the end of the scan. Lines containing high

resolution information are scanned rapidly twice. A first video signal is transmitted during the first scan and the remainder of



the video signal is transmitted during the rescan, the step command signal being transmitted at the end of the rescan.

3,723,641

FACSIMILE TRANSMISSION METHOD AND APPARATUS

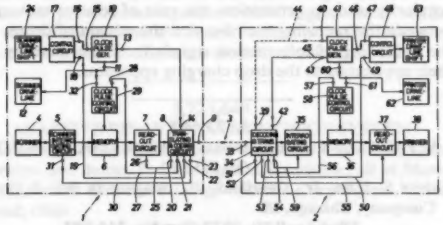
Frank-Armin Heinrich, Korb; Dieter Prause, Esslingen/Neckar, and Rolf Sost, Stuttgart, all of Germany, assignors to Robert Bosch Elektronik GmbH, Berlin, Germany

Filed March 31, 1971, Ser. No. 129,815

Claims priority, application Germany, April 2, 1970, P 20 15 695.0

Int. Cl. H04n *1/40, 7/12*

U.S. Cl. 178—6 **10 Claims**



An improved facsimile transmission method and apparatus whereby the data to be transmitted may be transmitted in a shorter time than with conventional facsimile systems. The picture to be transmitted is scanned line-by-line with a conventional photoelectric scanner, but preferably at a speed such that the scanning frequency is greater than the maximum transmission frequency of the transmission channel, and the scanning voltage, which represents at least two different brightness values, preferably black and white, for a single line stored in a memory. The memory is then read out and the number of consecutive identical brightness value signals counted. Each time that the brightness value signal changes its value, e.g., from white to black or vice versa, the readout of the memory is interrupted, or temporarily delayed, until a pulse sequence representing the counted identical consecutive brightness signals and the brightness value has been formed and transmitted. This sequence of steps is repeated for each picture line to be transmitted.

3,723,642

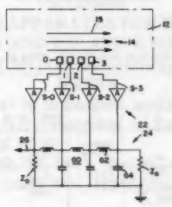
THERMAL IMAGING SYSTEM

Peter Laakmann, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 28, 1971, Ser. No. 147,924

Int. Cl. H04n *3/08, 5/30*

U.S. Cl. 178—6 **10 Claims**



A thermal imaging system wherein a field of view is optically scanned in a two-dimensional pattern by each element of a linear detector array. Output signals from each detector element are delayed as a function of the scan rate and the relative position of the element in the array, to allow the summation of signals from the same image segments, provided by the various elements of the array.

3,723,643

SYSTEM FOR RECORDING AND REPRODUCING A WIDE-BAND SIGNAL

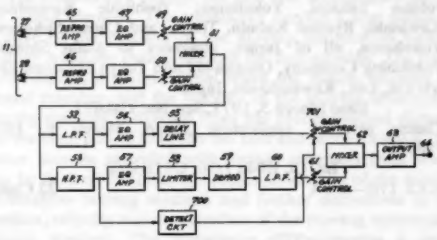
Takahiro Suzuki, and Yoshihiko Ota, both of Toxyo, Japan, assignors to Victor Company of Japan, Ltd., Mariya-Cho, Kanagawa-Ku, Yokohama-City, Kanagawa-Ken, Japan

Continuation-in-part of Ser. No. 773,848, Nov. 6, 1968, abandoned. This application June 3, 1970, Ser. No. 42,958

Claims priority, application Japan, Nov. 8, 1967, 42/71386; June 5, 1969, 44/4413

Int. Cl. G11b *5/04, 5/44;* **H04n** *5/78*

U.S. Cl. 178—6.6 A **11 Claims**



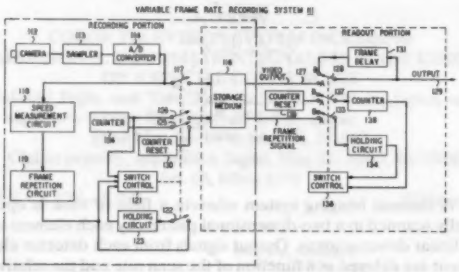
A tape recorder has the capability of recording a predetermined band width of signals which is not as wide as a TV band width. To record a TV band, the signals are divided into high and low component band. The high frequency band component is recorded directly on the recording medium, and the low frequency band component is frequency modulated on a carrier wave with an index of modulation which is over unity. The lower frequency limit of the deviated carrier wave is substantially equal to or higher than the highest frequency component of the wide-band signal. The frequency modulated carrier wave is recorded on the recording medium at a level at which it acts as a bias signal with respect to the high frequency band component. The original wide-band signal is reproduced from the recording medium during playback when the component bands are separated, demodulated, and recombined. The high frequency band component played back from the recording medium is controlled by other frequency component played back at the same time so that the level variations of the high frequency band component is corrected.

3,723,644

VARIABLE FRAME RATE RECORDING SYSTEM USING SPEED MEASUREMENT

Barin Geoffry Haskell, and John Ormond Limb, both of New Shrewsbury, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 24, 1972, Ser. No. 247,021
Int. Cl. H04n 5/78
U.S. Cl. 178—6.6 P 7 Claims



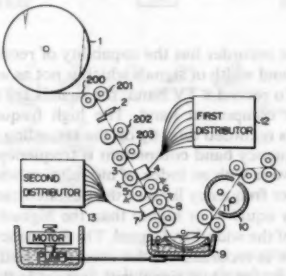
A variable frame rate video recording system utilizes the speed of movement in the video scene to vary the frame recording rate. The speed measurement signal is converted into a frame repetition signal. The frame repetition signal is applied to a switch control which prevents frames containing little movement or highly redundant information from entering a storage medium. With each recorded frame is stored the output signal of a counter which indicates the number of times each recorded frame is to be used for display. A switch control circuit in a readout circuit, in response to the stored output signal of the counter, causes each recorded frame to be repeated at the output terminal to maintain a constant frame rate.

3,723,645

FACSIMILE RECORDING SYSTEM FOR RECORDING PATTERNS ON BOTH SIDES OF A RECORDING MEDIUM

Hirohiko Takami, Yokohama; Toshihide Kawashima, Kawasaki; Ryomei Kubota, Tokyo, and Chosei Sukegawa, Yokohama, all of Japan, assignors to Asahi Shimbun Publishing Company, Ohsaka-shi and Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed March 3, 1971, Ser. No. 120,671
Claims priority, application Japan, March 5, 1970, 45/18535
Int. Cl. H04n 1/30; G11b 9/08
U.S. Cl. 178—6.6 A 22 Claims



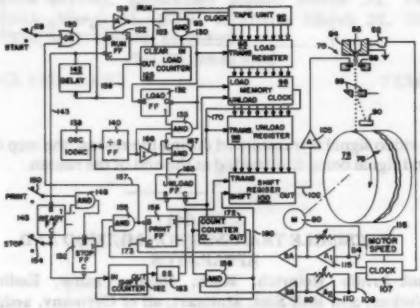
A facsimile system wherein two recording means are spaced from each other in the direction of movement of a recording medium, such as a recording paper, and wherein each of the recording means cooperates with one side of the recording medium. The recording means are each respectively supplied with video signals from respective video signal distributors. The spacing of the recording means avoids mutual interference therebetween when they are simultaneously operated to record patterns on both sides of the recording medium at the same time.

3,723,646

APPARATUS FOR RECONSTRUCTION OF IMAGES

David Behane, Yellow Springs; Lewis Harold Spradley, Centerville; Lysle D. Cahill, and William W. Marshall, both of Dayton, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 803,910, March 3, 1969, Pat. No. 3,604,846. This application April 5, 1971, Ser. No. 131,266
Int. Cl. H04n 1/24, 1/28
U.S. Cl. 178—6.6 R 5 Claims



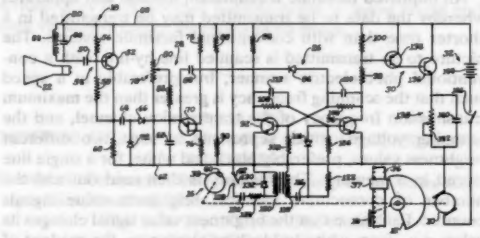
Code signals for reproduction of original graphic representations are stored in a memory, unloaded, and synchronously processed to control the charging of individual liquid drops which form dots in the proper matrix locations. The print-out is made through control of individual marking drops which are selectively charged and deposited on or diverted from the receiving member according to the code signals. A clock generates synchronizing signals which control the rate and regularity of drop generation, the rate of relative movement between the receiving member and the stream of drops, and the unloading of information signals from the memory and their application to the drop charging apparatus.

3,723,647

APPARATUS FOR RECORDING TELEVISION IMAGES ON FILM

Robert S. John, Jr., Deerfield, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed April 20, 1972, Ser. No. 246,051
Int. Cl. G11b 7/00
U.S. Cl. 178—6.7 R 10 Claims



An apparatus for synchronizing the operation of a motion picture camera to a television receiver to prevent "shutter bars" in the projected film image. The vertical retrace pulses from the television receiver are sensed, amplified and fed to an energy storage counter. The storage counter provides one

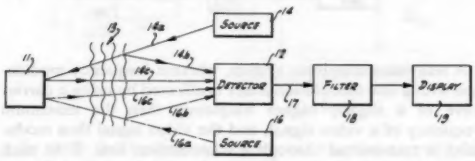
output pulse for every fourth retrace pulse. The output of the storage counter is fed to one input of a bistable multivibrator. The camera includes a 180° rotary shutter coupled to a pulse generator. The output of the pulse generator is fed to the second input of the multivibrator and the output of the multivibrator controls the camera motor. In this manner, the speed of the camera shutter is synchronized to the television retrace signal and the shutter phase angle with respect to the retrace signal remains constant.

3,723,648

METHOD AND APPARATUS FOR DISCRIMINATING AGAINST MASKING REFLECTIONS

Tom N. Cornsweet, Atherton, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed Feb. 1, 1971, Ser. No. 111,280
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **6 Claims**



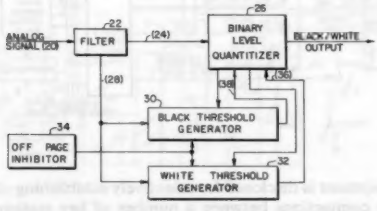
A method and means for discriminating against masking reflections reflected by an object or medium separating an observer from an object which it is desired to view. The desired object and medium are both illuminated by two alternating light sources emitting light of two different wave lengths. The light sources are adjusted so that a detector detects equal amounts of light reflected by the masking medium due to each light source. Assuming, however, that the object which it is desired to view has different spectral characteristics than the masking medium, it will reflect varying amounts of light from the two light sources as the light sources alternate. The reflected light from both the medium and the desired object is incident on a sensing means such as an image dissector and means are provided to separate the AC signal which will be due to reflections from the desired object from the DC signal which will be due to reflections from the masking medium.

3,723,649

ADAPTIVE BINARY STATE DECISION SYSTEM

Alexander D. Pitegoff, Brookline; Robert E. Wernikoff, Cambridge, and James E. Cunningham, Brookline, all of Mass., assignors to Electronic Image Systems Corporation, Cleveland, Ohio

Filed April 27, 1971, Ser. No. 137,763
Int. Cl. H04n *1/40*
U.S. Cl. 178—7.1 **18 Claims**



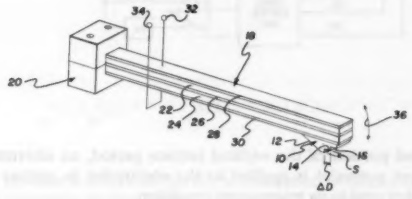
Means for quantizing the continuously varying analog signal output of a facsimile photodetector into a two level binary signal respectively characteristic of detailed black and white areas of a sheet being scanned. The quantizing means provides for later compression of the binary signal by limiting the level shifts in the binary signal to occur only when the analog signal clearly represents a change to the opposite characteristic as determined when the analog signal crosses two separated threshold levels that continuously or discretely adjust in response to the levels of the analog signal representing black and white.

3,723,650

METHOD AND APPARATUS FOR DERIVING THE VELOCITY AND RELATIVE POSITION OF CONTINUOUSLY MOVING INFORMATION BEARING MEDIA

John J. Bradley; Carl N. Schauffele, and John Q. St. Clair, II, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 22, 1971, Ser. No. 191,673
Int. Cl. G06k *7/04*; **H04l** *17/06, 17/12*
U.S. Cl. 178—7.2 **14 Claims**



Both the position and its time derivatives, such as velocity, of a continuously moving information bearing medium, such as perforated motion picture film, with respect to a predetermined position of apparatus for handling the information bearing medium are derived by a transducer with a specially shaped sensor element adapted to sense indicia, such as sprocket holes of motion picture film, carried by the information bearing medium. The sensor element includes at least first and second members located a predetermined distance apart, and the transducer is fixedly located with respect to the indicia carried by the moving information bearing medium so that the indicia successively engage the first and second members of the sensor element. The transducer derives a first signal indicative of the position of the moving information bearing medium when the indicia engages the first member. The transducer derives a second signal when the indicia engages the second member, and the velocity of the moving information bearing medium is derived from the predetermined distance and the time period between the first and second signals. The sensor may be provided with further members from which may be derived the instantaneous acceleration of the moving information bearing medium and further derivatives of the position, velocity and acceleration of the moving information bearing medium. The transducer may comprise a single piezoelectric element which is deflected by the engagement of the sprocket holes of the movie film by the first and second members of the sensor.

3,723,651

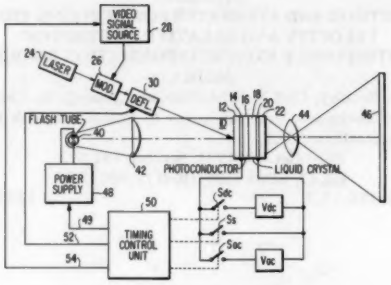
OPTICALLY-SCANNED LIQUID-CRYSTAL PROJECTION DISPLAY

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation

Filed Dec. 27, 1971, Ser. No. 212,506
Int. Cl. H04n *5/74*
U.S. Cl. 178—7.5 D **4 Claims**

A display system is disclosed which includes a multi-layer light control panel having a first transparent electrode, a photoconductor, a normally-transparent liquid crystal, and a second transparent electrode. A laser light beam is modulated with video information and raster scanned to the photoconductor. A direct-current potential is applied across the electrodes during the scanning of a frame, so that spatial variations are created in the light transmissivity of the liquid crystal. Dur-

ing a first portion of a vertical retrace period, a short circuit is placed across the electrodes, and a flash lamp is projected through the light control panel to a display screen. During a



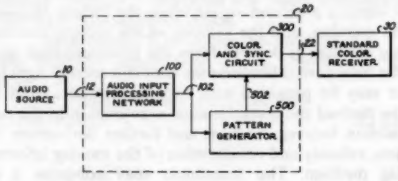
second portion of the vertical retrace period, an alternating current potential is applied to the electrodes to restore the liquid crystal to its transparent condition.

3,723,652

ELECTRICAL CIRCUIT FOR ENABLING THE VISUAL DISPLAY OF AN AUDIO SIGNAL BY A CONVENTIONAL TELEVISION RECEIVER

Harold G. Alles, 1860 Riverview St., and John C. Nosler, 2587 Floral Hill Dr., both of Eugene, Oreg.

Filed Oct. 12, 1970, Ser. No. 79,804
Int. Cl. H04n *9/00*; **A53j** *17/00*
U.S. Cl. 179—1 VS **35 Claims**



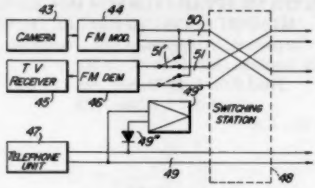
An audio-video interface network for transforming audio signals from an audio source into a form suitable for reception and visual display by an unaltered black-and-white or color television receiver whereby multifarious kaleidoscopic visual interpretations of the audio input signals may be entertainingly displayed upon the face of the television receiver. The interface network includes an audio signal separator for separating the audio input signals into a plurality of different frequency bands, an internal pattern generator responsive to the separated audio signals for generating a plurality of electrical signals each uniquely representative of the content of the audio input signals, and a video signal generator responsive to the separated audio input signals and the plurality of electrical signals for generating a modulated radio frequency television signal representative of the separated audio input signals as well as the internally generated electrical signals.

3,723,653

TELEVISION TELEPHONE SYSTEM

Yoshinobu Tatsuzawa, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 21, 1968, Ser. No. 769,051
Claims priority, application Japan, Oct. 24, 1967, 42/69116; Dec. 28, 1967, 42/79; Dec. 28, 1967, 42/81; Jan. 26, 1968, 43/4728; May 30, 1968, 43/37420; Aug. 8, 1968, 43/56894
Int. Cl. H04m *11/08*
U.S. Cl. 179—2 TV **3 Claims**



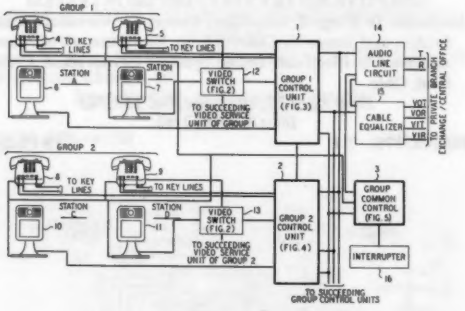
A television telephone system, wherein frequency-modulation with a low modulation index is effected by using a carrier wave of a slightly higher frequency than the maximum frequency of a video signal, and the video signal thus modulated is transmitted through a transmission line. With such system, a wide band video signal and audio signal can be transmitted without cross talk and distortion by using an ordinary telephone cable which is intended to be used only for the transmission of voice frequency signals, and communication can be achieved, with the image of the opposite party or drawing, document or the like being viewed.

3,723,654

GROUP SWITCHING ARRANGEMENT FOR KEY TELEPHONE SYSTEMS

Michael Kelly Bunce, Denver; Stanley Edward Bush, Boulder; George Arthur Fargo, Jr., Denver, and George Edwin Saltus, Boulder, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 22, 1970, Ser. No. 100,582
Int. Cl. H04m *11/00*
U.S. Cl. 179—2 TV **12 Claims**

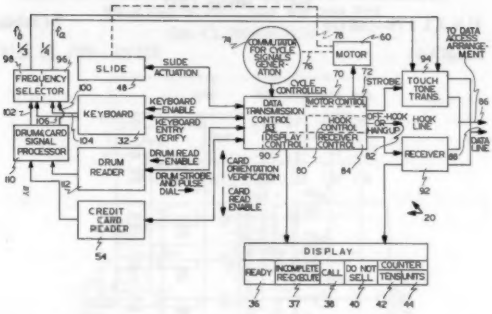


Equipment is disclosed for selectively establishing exclusive group connections between a number of key stations and a common wideband-audio communication facility in response to a key depression at one of the stations. The equipment can also automatically route incoming calls on the facility to a prescribed group of key stations. In addition, apparatus controllable by stations within each key group is disclosed for transferring calls to stations in other groups.

3,723,655
CREDIT AUTHORIZATION SYSTEM TERMINAL

Fredric E. Zucker; James P. Murphy; Lawrence J. Smith, and Joseph Kaswer, Jr., all of Stamford, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 16, 1971, Ser. No. 115,655
Int. Cl. H04m *11/06*
U.S. Cl. 179—2 DP 7 Claims



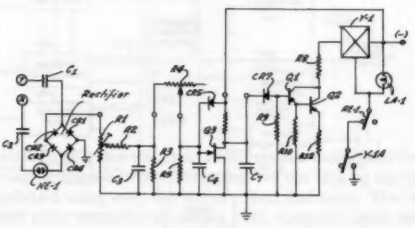
To verify the standing of a credit card account, a terminal is provided at the point of sale. The terminal automatically establishes telephone communication with a remotely located central data processor where data concerning the credit card account is stored.

The terminal includes: a replaceable storage medium which retains data for establishing the telephone connection with the data processor, as well as for identifying the terminal; a credit card reader which generates signals to identify the account for which credit is sought; and a keyboard used to transmit transaction-related data, such as dollar amounts. A cycle controller steps the terminal through successive operation modes, including receipt of return data from the data processor. The return data includes instructions which are decoded and displayed by the terminal to indicate the credit standing of the account. Various terminal circuits recognize erroneous conditions such as wrong orientation of the credit card, failure to enter keyboard data, or lack of communication line continuity to the data processor.

3,723,656
TELEPHONE ANSWERING SYSTEM

Lawrence A. Curtis, Hunting Beach, and Elmer C. Bonsky, Long Beach, both of Calif., assignors to T.A.D. Avanti Inc., Paramount, Calif.

Filed April 12, 1971, Ser. No. 132,961
Int. Cl. H04m *11/10*
U.S. Cl. 179—2 A 2 Claims

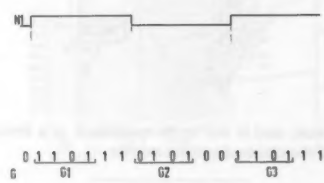


A control system is provided which is constructed to activate automatically a telephone answering unit, or any other electrical device, after a predetermined number of telephone rings. The control system to be described includes an electronic circuit which responds to the incoming telephone rings, and which may be adjusted to energize a relay after predetermined number of rings, the relay serving to short circuit the power switch of the controlled instrument, and to maintain the controlled instrument in an energized state.

3,723,657
PROCESS FOR THE TRANSMISSION OF BINARY CODED SIGNALS USING TIME MULTIPLEX TECHNIQUES

Henrik Muller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Feb. 9, 1971, Ser. No. 113,970
Claims priority, application Germany, Feb. 9, 1970, P 20 05 836.0
Int. Cl. H04j *3/04*
U.S. Cl. 179—15 BW 1 Claim



A process is described for the transmission of binary coded data according to time multiplex principles. The code element of least duration is scanned a number of times within each transmitting time. If a change in the modulation characteristic should occur, this is indicated by a registered count proportional to the elapsed time from the last transmitting time impulse to instant when the change occurred. The transmission of the message will then start simultaneously with the transmitting time impulse immediately following the modulation characteristic change. The message is data indicating when a change in characteristic occurred. The message will, of course, be transmitted in the one of the time channels which corresponds with the latter mentioned transmitting time impulse. Within the binary code group, by which a message is transmitted, the pulses giving information as to the point in time when a modulation change occurred are preceded by a start pulse or bit, which has a polarity or level corresponding to the new polarity or level which now exists after the change in the modulation characteristic. Also, after the transmission of the data indicating the point in time at which a change occurred, the existing polarity or level is again transmitted.

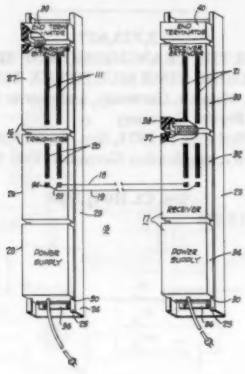
3,723,658
EXTENDABLE MULTIPLEXER

Werner P. E. Huebner, Toronto, Ontario, and Robert C. Long, Scarborough, Ontario, both of Canada, assignors to D. D. I. Communications, Inc., Lewiston, N.Y.

Filed June 30, 1971, Ser. No. 158,362
Int. Cl. H04j *3/00*
U.S. Cl. 179—15 R 30 Claims

A multiplexer is disclosed including a transmitter system and a receiver system wherein each has a plurality of modules. The modules are aligned and held in a guide channel and electrically and physically interconnected by plug and socket interconnections. Each system has a main module and at least one extender module which may be interconnected at the plugs and sockets for physical and electrical extension of the entire multiplexer as desired. An end terminator electrically terminates the sequential scan of the input terminals in the development of the time multiplexed signals, and another end terminator electrically terminates the transmitter system in the receiver system in its distribution of the multiplexed signals to output terminals thereon. The variable number of extenders permit an expandable ring in which the input terminals may be scanned and to which the output terminals the time division multiplexed signals may be distributed. The

foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation

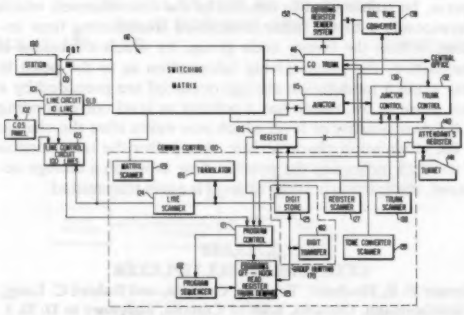


or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,723,659
GROUP HUNTING CIRCUIT

Ignas Budrys, and Ernest O. Lee, Jr., both of Fairport, N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 26, 1970, Ser. No. 83,938
Int. Cl. H04q *3/62*
U.S. Cl. 179—18 HA **37 Claims**

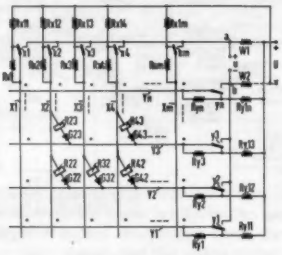


A group hunting circuit for a telephone system employs both consecutive and non-consecutive number hunting. During the consecutive hunting, when a pilot number of a hunting group is dialed and is found busy, the equipment automatically hunts in numerical sequence through the other lines of the group until an idle line is detected. The non-consecutive hunting arrangement permits a departure from one sequence of lines and continues sequential hunting beginning with another line. Skips may be strapped to specific numbers, whereby the equipment skips to a designated number and continues the sequential hunt. In this manner, the total number of lines consecutively tested may be maximized by inserting a skip at the last number of one sequence of lines and at the first number of another sequence of lines, so that the equipment hunts through the first sequence, skips to the first number in another sequence, and consecutively hunts through it.

3,723,660
SWITCHING CIRCUIT ARRANGEMENT FOR CROSS-WIRE CONTROL APPARATUS FOR COMMUNICATION SYSTEM

Peter Gerke, Grafelfing; Helmuth-Joachim Bock, Munich, and Anton Sennefelder, Gilching, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Dec. 21, 1970, Ser. No. 99,838
Claims priority, application Germany, Dec. 19, 1969, P 19 63 755.3
Int. Cl. H04m *3/00*
U.S. Cl. 179—18 GF **7 Claims**

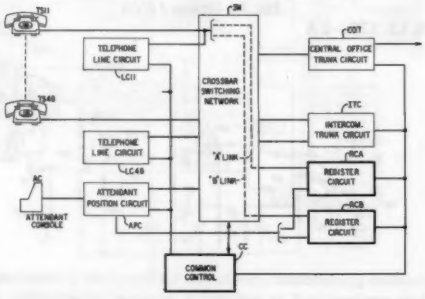


Control and auxiliary voltage sources are selectively connected to matrix row and column control inputs establishing a potential difference therebetween and across a selected receiving switching relay and its associated diode. The potential difference is fixed so that in the case of a diode breakdown, relays connected to that selected row and column are not affected. The biasing resistances assigned to each row and column are assigned values relative to the established potential difference resulting in minimum power dissipation. Make and break contacts serve to provide the necessary connections, and auxiliary biasing resistances associated therewith provide uninterrupted function of the device.

3,723,661
MULTIFUNCTIONAL SCANNER-COUNTER CIRCUIT

Raymond Whyte Dellecker, Denver; William Wallace Greason, III, Longmont, both of Colo.; Paul Ross Hayden, Marina Del Ray, Calif., and David William Weiner, Boulder, Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 26, 1971, Ser. No. 137,150
Int. Cl. H04q *3/42*
U.S. Cl. 179—18 FG **6 Claims**



This specification discloses a telephone system suitable for use as a private branch exchange and includes a switching network for establishing call connections between station line circuits, trunks and registers under electronic common control. Each register comprises control circuitry for switching a multifunctional counter circuit into a plurality of configurations

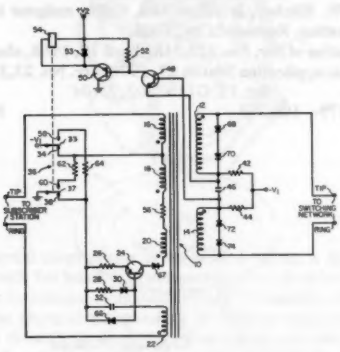
on a single call for initially scanning stations to detect call service requests, then counting dialed pulses transmitted from a calling station, and subsequently scanning stations on a callback operation to identify the calling station.

3,723,662

D.C. COMPENSATED SUBSCRIBER INTERFACE TRANSFORMER CIRCUIT FOR TELEPHONE SYSTEM

Max S. Macrander, Warrenville, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 9, 1971, Ser. No. 206,273
Int. Cl. H04m *3/04*
U.S. Cl. 179—18 HB **10 Claims**



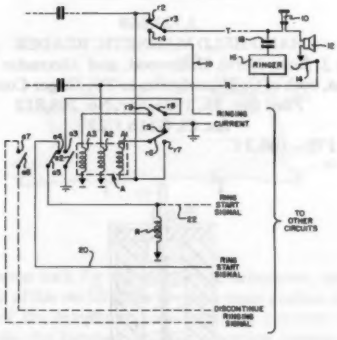
A miniature subscriber interface transformer circuit having a d.c. compensation circuit incorporated on one or both sides is provided with means for applying a high voltage, low frequency ringing signal to the subscriber line.

3,723,663

BATTERY FEED AND RING TRIP RELAY CIRCUIT

Joel J. Ewen, 35-51 87th Street, New York, N.Y.

Filed Sept. 24, 1971, Ser. No. 183,533
Int. Cl. H04m *1/00*
U.S. Cl. 179—84 R **3 Claims**



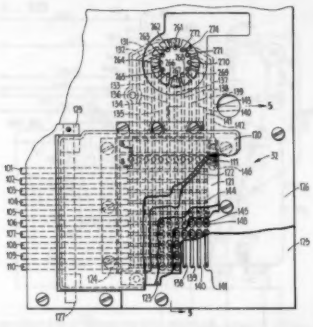
A battery feed and ring trip relay circuit for a telephone system is disclosed in which "tripping" of the ringing signal is accomplished using only the battery feed and relay. The battery feed relay includes a holding coil, normally open relay contacts in the energizing circuit for the holding coil, and contacts for de-energizing the ringing relay. The ringing relay includes normally open contacts in the energizing circuit for the holding coil of the battery feed relay. These ringing relay contacts open when the ringing relay is de-energized by the battery feed relay after the battery feed relay contacts in the energizing circuit for the holding coil are closed.

3,723,664

AUTOMATIC CARD READING PUSH BUTTON TELEPHONE SYSTEM UTILIZING FLUID PRESSURE TECHNIQUES

Ingemar H. Lundquist, 11300 Sun Valley Dr., Oakland, Calif.

Filed July 2, 1971, Ser. No. 159,359
Int. Cl. H04m *1/48*
U.S. Cl. 179—90 CS **12 Claims**



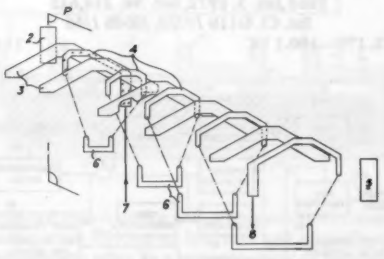
An ordinary pushbutton type automatic telephone is coupled with an apparatus for automatically and rapidly operating the keys in the desired sequence to fully operate the telephone to complete any desired number, local or long distance. The operating apparatus is controlled by a removable, prepunched paper or card upon which other information may be written; and operation is effected by means of fluidics, preferably under slight pressure.

3,723,665

INTEGRATED MAGNETIC HEAD HAVING ALTERNATE CONDUCTING AND INSULATING LAYERS WITHIN AN OPEN LOOP OF TWO MAGNETIC FILMS

Jean-Pierre Lazzari, Seyssinet; Igar Melnick, Grenoble, and Jean-Yves Vallet, Seyssinet, all of France, assignors to Commissariat AL' Energie Atomique and Co-pagnie Internationale Pour L' Informatique Louveciennes, France

Filed Oct. 19, 1970, Ser. No. 81,881
Claims priority, application France, Oct. 28, 1969, 6936863
Int. Cl. G11b *5/20, 5/42*
U.S. Cl. 179—100.2 C **7 Claims**



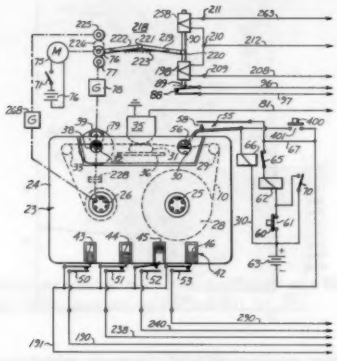
The open-loop magnetic circuit of an integrated magnetic head for reading and/or writing is made up of two magnetic films which are joined together at one end, the other end being placed in proximity to the writing and/or reading surface and substantially at right angles thereto. In order to form the electric winding for writing and/or reading, the magnetic head comprises within said loop and in an alternate arrangement a succession of electrically conducting and electrically insulating film layers which are at least partially superposed in a direction substantially at right angles to the plane of the two magnetic films.

3,723,666

METHOD FOR DISTINGUISHING PAUSES IN RECORDED FEATURES DURING REPLAY THEREOF

Leonard A. Ferrari, San Dimas, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed March 23, 1971, Ser. No. 127,263
Int. Cl. G11b *15/06*
U.S. Cl. 179—100.2 S **12 Claims**



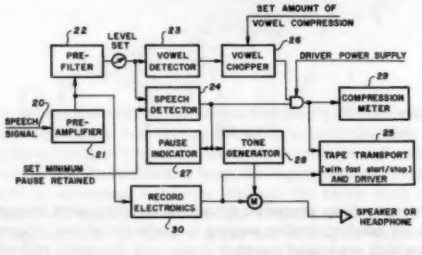
Recorded features having pauses between features and pauses during features are selectively replayed from a recording medium. The recording medium is selectively advanced at a first speed and pauses between features as well as pauses during features are picked up. Alternatively, the recording medium is advanced at a second speed and pauses between features as well as pauses during features are picked up. The pauses between features picked up during advancement of the recording medium at the first speed or at the second speed are distinguished from pauses during features picked up during advancement of the recording medium at the first speed or at the second speed, and a predetermined signal is provided only in response to each pause between features picked up during advancement of the recording medium at the first speed or at the second speed. The selective replay of recorded features is controlled with the aid of that predetermined signal.

3,723,667

APPARATUS FOR SPEECH COMPRESSION

John H. Park, Jr., St. Paul, and William C. Mortimore, Minneapolis, both of Minn., assignors to PKM Corporation, St. Paul, Minn.

Filed Jan. 3, 1972, Ser. No. 214,615
Int. Cl. G11b *19/20;* **H04b** *1/66*
U.S. Cl. 179—100.1 VC **11 Claims**



REALIZATION OF SPEECH COMPRESSOR

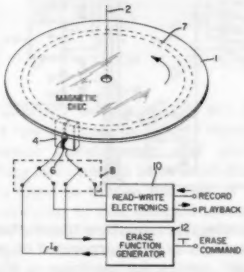
Means for recording and selectively deleting portions of normal speech sound which includes a recorder for receiving and recording speech signals from an input, with a drive means being provided for the recorder, and with a power supply being provided for the drive means. A speech detector is coupled to the power supply for the drive means and is arranged to energize the drive means only in response to the presence of a speech signal in the input. A vowel detector is provided and is coupled to the drive means power supply for detecting the initiation and continuing presence of vowel sounds in speech signals. The vowel detector is adapted to regularly and periodically interrupt the drive means power supply for certain predetermined time intervals in response to the initiation and continued presence of vowel sounds in the input.

3,723,668

METHOD OF ERASING SIGNALS FROM MAGNETIC DISCS USING DC PULSES WHICH PERSIST FOR ONE DISC REVOLUTION

Thomas W. Ritchey, Jr., Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 722,318, April 18, 1968, abandoned.
This application March 27, 1970, Ser. No. 23,322
Int. Cl. G11b *5/02, 25/04*
U.S. Cl. 179—100.2 D **11 Claims**



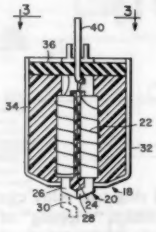
A method for selectively erasing single tracks of recorded signals from a magnetic disc and reconditioning the medium for re-recording. Erasure is effected by energizing a head with successive pulses of direct current alternating in the direction of current flow at decreasing levels of absolute magnitude, each pulse persisting for the duration of one disc revolution. The method further lends itself to track erasure using a read/write head.

3,723,669

HAND HELD MAGNETIC READER

Norman J. Bose, North Hollywood, and Alexander S. Brown, Covina, both of Calif., assignors to The Singer Company

Filed Dec. 16, 1971, Ser. No. 208,812
Int. Cl. G11b *5/22*
U.S. Cl. 179—100.2 C **5 Claims**

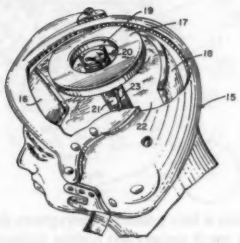


A compact magnetic tape reader for binary coded magnetic tapes or merchandise labels. The reader includes an electrostatically and magnetically shielded transducer wound with a symmetrical center tapped coils coupled directly to an integrated circuit buffer amplifier having a low impedance output for reducing the transmission of noise through the cable that couples the reader to the circuitry in stationary computing equipment.

3,723,670
HEAD CONTACT MICROPHONE SYSTEM

George J. Sebesta, Huntington Bay, and Arthur J. Mellen, Jr., Huntington, both of N.Y., assignors to Dyna Magnetic Devices, Inc., Hicksville, N.Y.

Continuation of Ser. No. 678,974, Oct. 30, 1967, abandoned.
This application Oct. 20, 1970, Ser. No. 82,520
Int. Cl. H04m *1/05*
U.S. Cl. 179—156 20 Claims

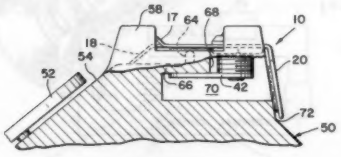


An inertial microphone is suspended within a helmet, for contact with the head. It is surrounded and shielded from external air turbulence. The microphone is uniquely mounted to inhibit the physical transmission of ambient noise and vibration to it through its mounting. One's face and hands remain unencumbered. Voice vibrations pass through the skull and head tissue, on to the microphone. Satisfactory speech communication is obtained even while in 100 knot winds and/or in noise levels up to 120 decibels. Useful in military, helicopter, fire and police operations.

3,723,671
TELEPHONE LOCK

Gilbert Edelcreek, 98 Fieldstone Dr., Springfield, N.J.

Filed March 23, 1972, Ser. No. 237,270
Int. Cl. H04m *1/66*
U.S. Cl. 179—189 R 11 Claims

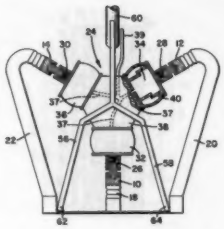


A telephone lock for a French-style telephone, made of a single piece of flat metal stock having a main portion overlying the shelf of the telephone base which is between the lugs which cradle the handset, the main portion having ears extending between the lugs to hold down the telephone switch buttons, the main portion extending rearwardly of the shelf and having a cylinder lock mounted in it rearwardly of the shelf, the cylinder lock having a locking tongue which is in a plane closely beneath the shelf in its locking position. A front tab portion extends downwardly from the front of the main portion, close to or engaging the telephone base, and a rear tab portion extends downwardly from the main portion, substantially covering the recess below the shelf, and having laterally extending ears which engage the telephone base rear face. All of the ears are provided on their bottom surfaces with resilient pads.

3,723,672
ELECTRICAL DISTRIBUTION AND CURRENT COLLECTING SYSTEM FOR A HIGH SPEED VEHICLE

Jean-Pol Payen, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Oct. 6, 1970, Ser. No. 78,414
Claims priority, application France, Sept. 18, 1970, 7034718; Sept. 18, 1970, 7034719; Sept. 18, 1970, 7034717
Int. Cl. B60l *5/00*
U.S. Cl. 191—50 22 Claims

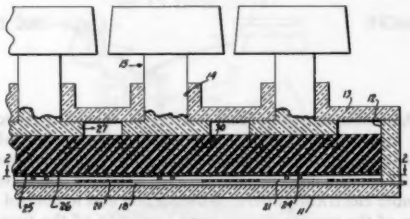


Current collecting system for a high speed vehicle movable along a track. A multi-phase conductor system extends along the track and defines a passageway for a movable collector head. The collector head comprises retractable contact shoe means capable of resilient engagement with the conductors. Linkage means connecting the collector head to the vehicle permit to withdraw the collector head from the passageway and to stock it in a housing in a non-operative position. Movable contact means connect the collector head electrically to the vehicle and allow relative movement of the collector head with respect to the vehicle.

3,723,673
KEYBOARD SWITCH ASSEMBLY WITH WIRE CONDUCTOR MATRIX CONTACT ARRAY

John G. Clary, Pasadena, and Larry K. Wirtz, La Habra, both of Calif., assignors to Addmaster Corporation, San Gabriel, Calif.

Filed Oct. 13, 1971, Ser. No. 188,956
Int. Cl. H01h *13/52*
U.S. Cl. 200—1 R 3 Claims

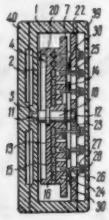


A keyboard switch device comprising rows and columns of intersecting wires conductors held taut and normally spaced slightly from each other by a separator sheet of non-conducting material having openings therein aligned with the intersections of at least certain of the conductors. The conductors are engaged by depressing different keys aligned with the conductor intersections and a relatively thick layer of soft elastomeric materialis interposed between the keys and conductors to normally hold the keys in raised position and to transmit pressure from the keys to engage the conductors. By merely changing the sizes, shapes and positions of the openings, the switching device can be made to produce different output coded signals. Also, by changing the configuration of the various rows and columns of conductors different switch matrix patterns can be produced.

3,723,674
THUMBWHEEL SWITCH WITH IMPROVED THUMBWHEEL CAMMING STRUCTURE FOR RESILIENT CONTACTS

Emmanuil Lipovich Khitro, Nikitinskaya ulitsa, 1911, kv. 62, and Nikolai Nikolaevich Zhekhov, ulitsa Demyana Bednogo, 20, korpus 2, kv. 48, both of Moscow, U.S.S.R.

Filed Jan. 28, 1972, Ser. No. 221,741
Int. Cl. H01h *19/58, 21/78*
U.S. Cl. 200—11 TW 1 Claim



The essence of the invention consists in a switch which comprises a digit wheel and spring contacts, arranged in a housing together with a means for presetting a program of direct and inverse commutation of circuits by said spring contacts. Said means is made in the form of rings of dielectric material disposed concentrically on a contact member secured on said wheel. The rings have shaped projections. The spring contacts are made in the form of U-shaped contacts and a comb-shaped contact having blades the number of which is equal to the number of the U-shaped contacts. The comb-shaped contact and the U-shaped contacts are placed on a plate mounted in the housing.

3,723,675
STOPWATCH-TIMER ASSEMBLY WITH IMPROVED STOPWATCH CONTACT MECHANISM

Charles F. Richey, Springfield, Oreg., assignor to Data Time, Inc., Beaverton, Oreg.

Filed June 23, 1971, Ser. No. 156,005
Int. Cl. H01h *19/10*; G04f *9/06*
U.S. Cl. 200—38 R 7 Claims

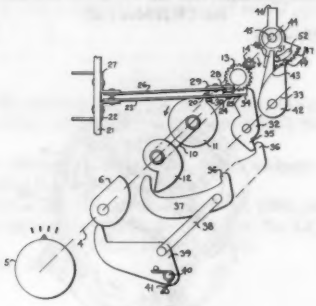
A combination of a hand-held timer, including an actuator for initiating operation of the timer, and a switch which is closed on operation of the actuator. The switch is connected by means of a metallic pawl through a flexible conductor, to a remote electrically operated device and acts to control operation of the remote device upon operation of the timer. In a modified form of the invention, an annular insulative element with a conductive layer electrically connected to the timing device is rigidly fixed to the exterior of the stopwatch casing. Upon depression of a metallic plunger, an electrical circuit is completed and consequently a time interval is measured.

3,723,676
LATCH-TRIP CAM OPERATED PERCENTAGE TIMER

John L. Harris, Delafield, Wis., assignor to Deltrol Corp., Bellwood, Ill.

Filed Oct. 12, 1971, Ser. No. 188,347
Int. Cl. H01h *43/10, 7/08*
U.S. Cl. 200—39 R 10 Claims

A percentage timer includes two cam operated switch blades which are periodically raised and dropped. A latch engages one of the switch blades after it has dropped, causing contact closure until the latch is released by a follower riding a cam rotating with the switch cam. Adjustment of the release point to determine the percentage of on time is achieved by

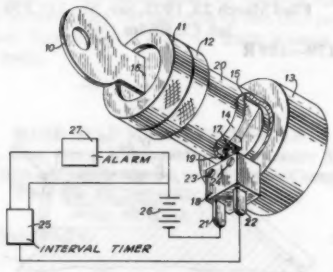


bodily moving the pivot of the follower by means of an adjusting cam and an adjusting cam follower. All of the cams are mounted on a common axis making a compact construction. A manual preset timer is arranged to override the percentage timer when used.

3,723,677
IGNITION KEY ALARM

Alan Arias, 3827 Dover Center Rd., North Olmstead, Ohio

Filed Jan. 5, 1970, Ser. No. 759
Int. Cl. H01h *27/00*
U.S. Cl. 200—44 5 Claims

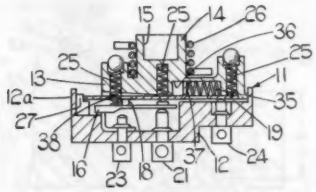


An auxiliary, momentary contact, electrical switch with normally open contacts is combined with a rotary ignition or motor starting switch of the type conventionally used in automobiles and other vehicles. The contacts of the auxiliary switch are closed by the ignition key either by inserting this key in the ignition switch or by turning the ignition switch from one of its on positions to its off position. The auxiliary switch forms part of an electrical circuit comprising an electrical storage battery, an interval timer, and a buzzer. The combination of the above elements works so that if the ignition key is left for more than a few seconds in the ignition switch while this ignition switch is in its off position the buzzer is turned on by the interval timer. This alarm reminds the operator of the vehicle to remove the key from the ignition switch. If the buzzer sounds and the key is not removed from the ignition switch within a predetermined time interval the interval timer shuts the buzzer off.

3,723,678
IGNITION SWITCHES

Alec John Heap, 18 Brunshaw Avenue, Burnley, England

Filed Nov. 18, 1971, Ser. No. 199,874
Claims priority, application Great Britain, Nov. 21, 1970, 55,499/70
Int. Cl. H01h 27/06
U.S. Cl. 200—42 A 4 Claims

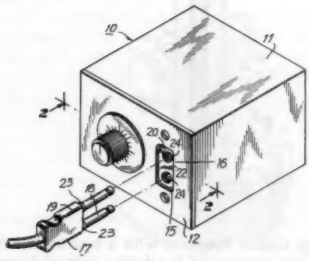


An ignition switch comprises a casing and a rotor mounted in the casing for rotation within the casing from a stable first position to a stable second position and from the stable second position to an unstable third position, from which the rotor is resiliently urged back to said second position. First and second fixed contacts are supported in the casing and a first bridging member is rotatable with the rotor and operable to complete an electrical circuit between the first and second fixed contacts in the third position of the rotor. An arcuate cam track is provided on the inner surface of the casing and said first bridging member is resiliently urged into engagement with the cam track. The arrangement of the cam track is such that during movement of the rotor from the second position to the third position unless the preceding movement of the rotor was from the first position to the second position, the first bridging member is moved by the cam track in a direction such that in the third position the circuit between the first and second fixed contacts is not completed.

3,723,679
SWITCHING APPARATUS

William V. Carney, Valley Stream, N.Y., assignor to Porta Systems Corp., Roslyn, N.Y.

Filed Feb. 28, 1972, Ser. No. 229,821
Int. Cl. H01h 9/20, 33/46
U.S. Cl. 200—50 B 17 Claims

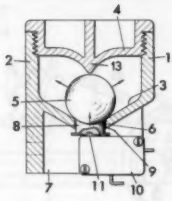


A rotary switch arrangement for selectively connecting a desired one of a number of input terminals to a dual phone jack. A mechanical linkage arrangement is provided to prevent rotation of the switch when a dual phone plug is inserted into the jack. This arrangement eliminates line transients caused by rotation of the switch while currents are flowing through the phone jack.

3,723,680
ACCELERATION RESPONSIVE SWITCHING DEVICE

Masaru Suzuki, Chiryu; Masayoshi Iwata, Hajima, and Takeo Matsui, Gifu, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Aichi-Pref., Japan

Filed Aug. 18, 1971, Ser. No. 173,711
Claims priority, application Japan, Aug. 21, 1970, 45/83711; Feb. 20, 1971, 46/9779
Int. Cl. H01h 35/14
U.S. Cl. 200—61.45 R 5 Claims

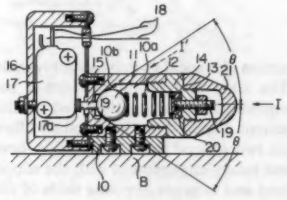


An acceleration responsive switching device which comprises a casing having, at its bottom portion, a reverse cone-shaped inner wall, a weight ball movably put in the casing and normally positioned on said reverse cone-shaped inner wall at its central portion, a switch means provided in the casing at the center of the bottom portion and being normally in contact with said weight ball and adapted to be disengaged from the contact with said ball when the ball is upwardly moved along an inclined face of said reverse cone-shaped inner wall due to an acceleration given. The present switching device is exactly and instantaneously responsive to an excessive acceleration, thereby enabling the traffic accident to be effectively avoided. The device is simple in construction and easy to manufacture at a reasonable cost.

3,723,681
COMBINATION IMPACT DETECTOR AND SWITCH DEVICE

Takashi Haruna, Yokosuka, and Akira Shimano, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed March 19, 1971, Ser. No. 125,951
Claims priority, application Japan, June 25, 1970, 45/63361
Int. Cl. H01h 35/14
U.S. Cl. 200—61.53 3 Claims



Herein disclosed in a combination impact detector and switch device which is responsive to an impact exerted thereon in a direction falling within a predetermined angular range and which includes a normally open switch and a spring-loaded spherical weight normally pressed upon a tapered inner peripheral wall to keep the switch open and caused to leave the peripheral wall to close the switch when an impact greater than a predetermined magnitude is transferred thereto in a direction contained in the angular range limited by the tapered inner peripheral wall. The device may be utilized in various vehicluar safety apparatus for protecting a vehicle occupant from injury by a collision, wherein the switch may be

connected to an actuator of the safety device to cause the safety device to assume a protective position when an impact is encountered by the motor vehicle.

3,723,682

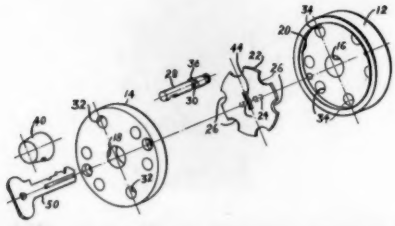
COMBINATION CONTROLLED ACTUATING DEVICE

Clyde E. Pecott, Wethersfield, Conn., assignor to Safe Key Lock Company, Rocky Hill, Conn.

Filed March 23, 1971, Ser. No. 127,143

Int. Cl. E05b *45/08*

U.S. Cl. 200—61.64 **1 Claim**



A combination control device for rotative members such as ignition locks, home locks and the like wherein rotation of the actuating member (key) is prohibited until the various elements of the control device are in preselected positions. Unauthorized manipulation of the device will result in the sounding of an alarm if the device is wired to do so.

3,723,683

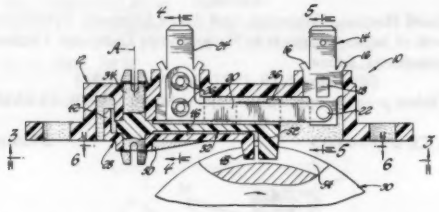
SNAP ACTION SWITCH ASSEMBLY

Thomas M. Tucker, Royal Oak, and Edwin F. Clemett, Jr., Detroit, both of Mich., assignors to McCord Corporation, Detroit, Mich.

Filed July 1, 1971, Ser. No. 158,917

Int. Cl. H01h *15/18*

U.S. Cl. 200—78 **15 Claims**



A snap action electrical switch assembly including a support housing. The support housing includes a movable contact means comprising a metal cantilevered resilient lever with a contact element disposed on the distal end thereof and movable between two spaced fixed contacts. A control member is snapped into rotary engagement with the support housing and extends along and engages opposite sides of the resilient lever intermediate the ends thereof. A projection extends downwardly from the control member and engages a groove in a rotary cam. A biasing member is snapped onto and is rotatably supported on the control member and includes a forwardly extending portion having a projection engaging the groove in the rotary cam. The biasing member also includes parallel arms on each side of the control member for biasing the resilient lever in opposite directions so that as the cam rotates the biasing member moves between opposite positions biasing the resilient lever in one of two opposite directions before the cam allows the control member to rotate at which time the resilient lever will be allowed to move the contact element into or out of engagement with one or the other of the fixed contacts.

3,723,684

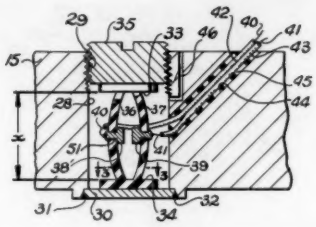
PRESSURE RESPONSIVE SWITCH WITH PARALLEL CONTACT BLADES BENT APART BY AXIAL FORCE APPLIED BY DIAPHRAGM

Roger Greenwood, Valencia, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed April 9, 1971, Ser. No. 132,795

Int. Cl. H01h *35/34*

U.S. Cl. 200—83 R **1 Claim**



A pressure switch for use in, for example, an automobile air bag safety buffer system in the event of a collision. The switch contacts are carried by, for example, plastic leaf springs that are column loaded. A flexible spring diaphragm loads the springs when fluid pressure is applied to the diaphragm. The switch contacts may be snap fit onto the springs. A loading adjustment screw may be provided, if desired. The switch cavity may also be vented to the atmosphere, if desired, to ensure the correct pressure differential across the diaphragm.

3,723,685

HIGH VOLTAGE CIRCUIT BREAKER

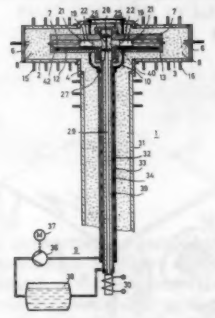
Gerhard Thurk, and Helmut Beier, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Erlangen, Germany

Filed Jan. 12, 1972, Ser. No. 217,193

Claims priority, application Germany, Dec. 11, 1970, P 20 63 093.7

Int. Cl. H01h *33/54*

U.S. Cl. 200—148 E **2 Claims**

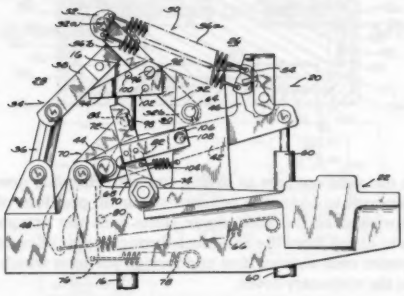


In high voltage circuit breakers with a hydraulic actuator, the lines of which consist of insulating material and lead through sulfur hexafluoride, the problem exists that the lines can be attacked by the decomposition products of the sulfur hexafluoride SF_6. This has been prevented by surrounding a high pressure hydraulic line by a low pressure hydraulic line. The low pressure line consists of insulating material which is insensitive to decomposition products of the sulfor hexafluoride, while the high pressure line consists of glass fiber reinforced insulating material. The invention is particularly suitable for high power circuit breakers.

3,723,686
QUICK CLOSING MECHANISM FOR CIRCUIT INTERRUPTER

Max Rigert, West Allis, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed June 28, 1971, Ser. No. 157,325
Int. Cl. H01h 3/30
U.S. Cl. 200—153 SC 8 Claims

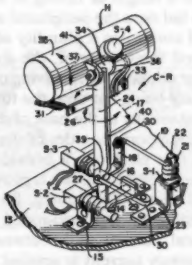


A circuit interrupter having an operating mechanism including means for providing and controlling a quick closing operation is disclosed. The mechanism includes a pivotable lever connected to a contact operating rod which is biased toward closing by a first spring means and a second spring means. When the pivotable lever is in a contact open position and a closing operation is occurring, a latch means holds the pivotable lever in an open position until the first spring means reaches its optimum closing force position. At the same time, the latch means and the pivotable arm hold the second spring means in a static, charged condition. When the first spring means reaches its optimum closing force position, an arm moved by the first spring means releases the latch means so that the pivotable lever is free to be snapped to a closed position by the simultaneous force of both the first and second spring means to thereby rapidly close the contacts.

3,723,687
HANDGRIP MULTIPLE SWITCH ASSEMBLY INCLUDING ROTATABLE HANDLE AND UNIVERSAL JOY STICK TYPE CONTROL

Fred H. Adkinson, P.O. Box 158, Minneola, Fla.

Filed Jan. 20, 1972, Ser. No. 219,387
Int. Cl. H01h 21/10
U.S. Cl. 200—157 10 Claims

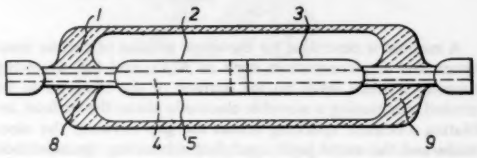


A post swingable on a support is connected to a first switch on the support for actuating the same by swinging movement of the post. A sleeve rotatable on the post is connected to a second switch for actuating the same by rotation of the sleeve. The sleeve has a cross bar with a tubular hand grip rotatable thereon, and the hand grip is connected to a third switch for actuating the same by rotation of the hand grip. A fourth switch such as a push button switch may be provided on the hand grip. The arrangement permits selective actuation of the several switches by one hand.

3,723,688
SWITCH SPRING FOR A RELAY

Ingo Eichhorst, Ulm Wiblingen, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Aug. 13, 1971, Ser. No. 171,521
Claims priority, application Germany, Aug. 20, 1970, P 20 41 318.7
Int. Cl. H01h 1/02
U.S. Cl. 200—166 C 4 Claims

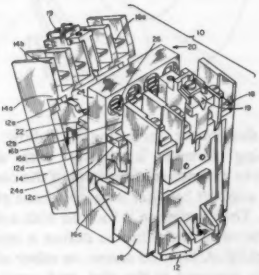


A relay switch spring composed of an elongated flat strip which has a core made of an electrically conductive material surrounded by a sheath of material of a lower conductivity than the core material. The strip has a free end to which a contact is connected so that the contact engages both the core and sheath material.

3,723,689
LOCATING ARRANGEMENT FOR THE MOVING CONTACT CARRIER OF A RELAY

Lyle John Wenzel, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 30, 1971, Ser. No. 175,942
Int. Cl. H01h 1/20, 1/32
U.S. Cl. 200—166 BC 6 Claims

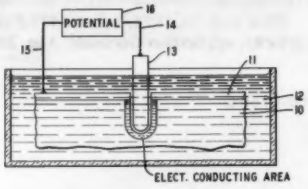


A relay of the type having split housings, which support fixed contacts, associated with and divergently movable with respect to a base and to each other so as to allow introduction and servicing of a reciprocally movable contact carrier including a locating arrangement which is operative with the housings in the divergent open condition to limit the position of the movable contact carrier with respect to the housings so that upon the convergent closed condition of the housings being attained the moving contacts of the movable contact carrier are properly oriented with respect to the fixed contacts of the housing.

3,723,690
SPARK EROSION OF MATERIALS

Yoshinao Nakada, Emmaus, Pa., and David Gilbert Thomas, Summit, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1971, Ser. No. 169,970
Int. Cl. B23p 1/08; H05b 7/18
U.S. Cl. 219—69 M **6 Claims**

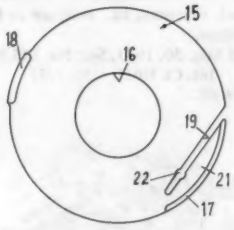


A method is described for the spark erosion of certain insulators and semiconductors such as Al_2O_3 and SiC involving forming a metal layer on the surface of the material to be eroded, positioning a movable electrode above the surface, initiating electrical sparking across the gap between the electrode and the metal layer, and then advancing the electrode toward the surface so as to maintain sparking, resulting in spark erosion of the surface. The method enables the implacement of holes of a variety of shapes and sizes at erosion rates of about 3 to 10 micrometers per second.

3,723,691
AN IGNITION DISTRIBUTOR BASE PLATE HAVING INTEGRAL RESILIENT SECURING MEANS

Alfred Rees, Perry Barr, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 22, 1971, Ser. No. 165,183
Claims priority, application Great Britain, July 28, 1970, 36,415/70
Int. Cl. H01h 9/02
U.S. Cl. 200—168 R **10 Claims**



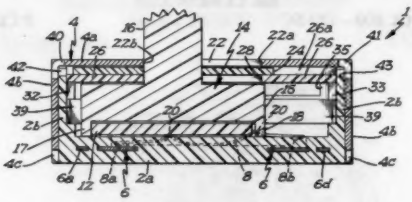
An ignition distributor including a hollow substantially cylindrical casing formed internally with a peripheral shoulder. A groove extends into the wall of the casing from the shoulder, and a contact breaker assembly base plate is seated on the shoulder. The base plate is formed with a slot which extends along a chord of the plate to define a resilient ear integral with the plate. A tapered screw, or other alternative expansion means is engaged in the slot, and urges the resilient ear in a direction away from the remainder of the base plate so as to urge the ear into the groove, and so clamp the base plate in position in the casing.

3,723,692
DUST COVER FOR SWITCHES

Lester L. Wilbrecht, 45 Mid Oak Ln., St. Paul, Minn.

Filed June 7, 1972, Ser. No. 260,486
Int. Cl. H01h 9/04
U.S. Cl. 200—168 H **8 Claims**

An electrical switch having contact elements housed within an enclosure and including a shiftable actuator for the contacts extending outwardly from the enclosure through a slot in one wall thereof is protected against the entry of foreign particles by a double cover structure behind the slotted enclosure wall, including a slide cover on the actuator movable therewith and a stationary cover behind the slide cover with

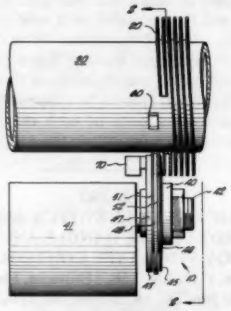


which the slide cover is in sliding contact. The slide cover is large enough to cover the actuator slot in all positions of the actuator; and as the slide cover shifts with the actuator it serves to expell from the enclosure through a pair of openings in opposite ends thereof dust and foreign particles which collect on the stationary cover.

3,723,693
FINTUBE WELDING APPARATUS

Robert Carl Boose; Henry Weaver, both of Pryor, and Harry Moore, Claremore, all of Okla., assignors to Escoa Fintube Corporation, Pryor, Okla.

Filed Sept. 13, 1971, Ser. No. 179,798
Int. Cl. B23k 11/08
U.S. Cl. 219—62 **11 Claims**



An apparatus for mounting and welding fin stock to a tube is disclosed. The apparatus comprises a weld wheel rotatably mounted adjacent to a length of tubing at the point where a length of fin stock is fed onto the peripheral surface of the tubing. The weld wheel comprises a plurality of discs having annular portions spaced therebetween, the space between the discs forming annular pockets for receiving one or more of the fin portions as they are being fed onto the tubing. The sides of the discs extend substantially to the base of the fin stock to engage and adequately support the sides of the fin portions during such feeding. A first electrode is provided to contact the tubing surface, and a second electrode is provided to contact a portion of the weld wheel. The tubing, fin stock, and weld wheel are in continuous metal-to-metal engagement to establish an electrical current path between the two electrodes. A high frequency current is applied through the current path to melt the root of the fin stock and the surface of the tubing immediately prior to their mutual engagement point. As the fin stock and the tubing are drawn together, the annular portions function to apply a forging force to the fin stock to create a fused bond between the fin stock root and the tubing. Because of the lateral support provided by the weld wheel pockets, the wiggling at the base of the fin stock is minimized, thereby creating a stronger weld connection with the tubing.

3,723,694

MACHINE FOR CHECKING AND CORRECTING ELEMENTS OF HYBRID INTEGRATED CIRCUITS BY MEMORIZING DATA

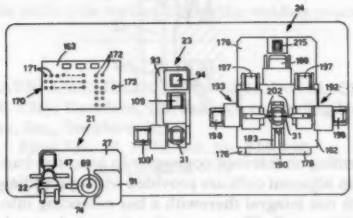
Renato Conta, and Giuseppe Mariani, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.P.A. (Turin), Italy

Filed March 22, 1971, Ser. No. 126,604

Claims priority, application Italy, March 20, 1970, 67941 A/70; April 30, 1970, 68495 A/70

Int. Cl. B23p *1/08*, *1/12*

U.S. Cl. 219—69 V 24 Claims



A machine for checking and trimming circuit elements, for example resistive elements of hybrid integrated circuits produced by depositing thin film on a plate, is formed of separate stations. In a first station a checking device measures sequentially all elements and records the measurement on a memory. The records are evaluated to establish whether the integrated circuit is to be trimmed or not. If it is to be trimmed, in a second station a trimming tool is automatically brought in correspondence with the specific element to be trimmed and operates alternately with a device for comparing the element with a specimen, until the element falls within a certain range of tolerance.

3,723,695

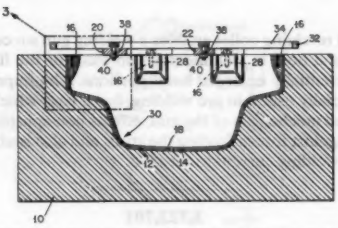
EDM ELECTRODE

Ludwik Gutnajer, Carversville, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Dec. 17, 1971, Ser. No. 209,059

Int. Cl. B23p *1/04*, *1/08*

U.S. Cl. 219—69 E 3 Claims



An all metal EDM electrode comprises a hollow shell with attachment means. The electrode is formed by depositing a layer of metal on a mandrel having a surface contoured to a desired configuration. A plurality of metal inserts are attached to the layer of metal. A second layer of metal is then deposited over the first coating and the metal inserts. The metal inserts serve as elements to permit the electrode to be mounted to a movable ram in an electric discharge machining unit.

3,723,696

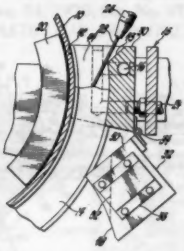
HINGED WELDING SHOE

Donald F. McCall, Dorchester, Ontario, Canada, assignor to General Motors Corporation

Filed Feb. 14, 1972, Ser. No. 226,027

Int. Cl. B23k *9/18*

U.S. Cl. 219—73 3 Claims



A welding shoe used in building a flange on a circular workpiece has a weld forming cavity shaped to the desired cross-section of the flange. A bottom closure member hinged to the shoe body retains the initial weld puddle until congealed and then pivots out of the way to permit relative movement of the shoe and the workpiece.

3,723,697

INFRA-RED SOLDERING APPARATUS INCORPORATING PRESSURE APPLYING STRUCTURE-THERETO

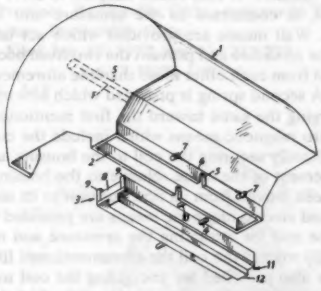
Frank Kennedy King, Broadstone, England, assignor to Plessey Handel Und Investments A.G., Zug, Switzerland

Filed Nov. 18, 1971, Ser. No. 199,877

Claims priority, application Great Britain, Dec. 22, 1970, 60,933/70

Int. Cl. B23k *1/02*

U.S. Cl. 219—85 2 Claims

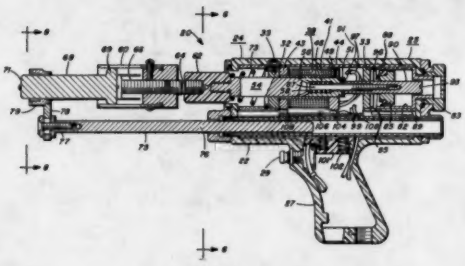


To ensure good pressure distribution to the individual conductor pairs to be solder-joined when effecting infrared-light soldering of a set of conductors on a flexible infrared-pervious substrate to a second set of conductors on a second substrate, a strip-type focussed infra-red source is equipped with a pressure pad which is pivotally supported by trunnions resting on pressure application spring bars, and which consist of a quartz bar fitted at its pressure-transmission face with a pressure-distribution pad made of SYLGARD 182 silicone resin, a material which has a high infra-red transmission combined with good resilience and temperature resistance.

3,723,698
STUD WELDING APPARATUS

Lewis J. Logan, Lakewood, and Dante J. Sandoval, Cleveland, both of Ohio, assignors to Tree-Fit Products Corporation

Filed Dec. 29, 1971, Ser. No. 213,294
Int. Cl. B23k 9/20
U.S. Cl. 219—98 11 Claims



The present invention relates to stud welding apparatus and involves such an apparatus with means which will accommodate inaccuracies in the manufactured length of studs which are to be welded to provide the accurate lift required to appropriately melt the end of the studs and the portion of the beam to which the studs are to be subsequently attached. The present apparatus also provides means whereby the plunge distance of the stud can be varied and adjusted as desired in the event, for example, the stud is to be joined to a beam where thin metal decking is provided over the beam. The apparatus includes a housing which has first and second end portions and a coil is carried in the housing and is movable axially relative to the housing between first and second positions. An armature is positioned within the coil and is movable with the coil between the aforementioned first and second positions and is also movable axially relative to the coil what is commonly referred to as a lift distance. A first spring acts between the coil and the armature and normally keeps these two mentioned parts axially spaced from each other the aforementioned lift distance. A stud chuck adapted to carry the stud to be welded, is connected to the armature and is movable therewith. Wall means are provided which act between the coil and the armature and prevent the two from becoming axially spaced from each other more than the aforementioned lift distance. A second spring is provided which acts upon the armature urging the same toward the first mentioned position. First electro magnetic means which include the coil are provided for fixedly securing the coil to the housing and prevent axial movement of the same relative to the housing after the coil has been moved from its first position to its second position. Second electro magnetic means are provided which also include the coil for attracting the armature and moving the same axially toward the coil the aforementioned lift distance. Means are also provided for energizing the coil to cause the aforementioned functions. The inertia of the first electro magnetic means is less than the inertia of the second electro magnetic means so that upon energization of the coil, the coil is first fixedly secured to the housing by means of the first electro magnetic means prior to the armature moving axially toward the coil the lift distance by the action of the second electro magnetic means. Movement of the armature toward the coil causes the stud to be lifted from the surface with which it is engaged and then of course during this operation the conventional arc is established between the tip of the stud and the member to which it is engaged and thereafter heavy welding current is passed between the tip of the stud and the beam which causes melting of the end of the stud and also melting of that portion of the beam which is adjacent the end of the stud and to which the stud is to be attached.

3,723,699
INTERCELL CONNECTION MAKING IN ELECTRIC STORAGE BATTERIES

Brian Robert Allen, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

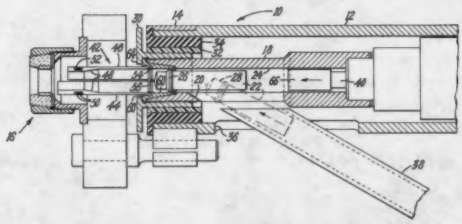
Continuation of Ser. No. 712,798, March 13, 1968, abandoned. This application April 30, 1970, Ser. No. 31,846
Claims priority, application Great Britain, April 11, 1967, 16,544/67
Int. Cl. H01r 43/00; H05k 43/00
U.S. Cl. 219—78 2 Claims

In forming an intercell connector in a storage battery, plate groups in adjacent cells are provided with upstanding lugs, one of which has integral therewith a bar extending into a hole in the partition wall. The connection is made by applying pressure to the lugs with electrodes and then passing a current, and the invention consists essentially in shaping the electrode acting on the lug which does not have a bar so that a coining operation is performed and the hole in the cell wall is sealed before electric current is passed.

3,723,700
WELDING GUN MEANS FOR FEEDING AND HOLDING HEAD-BEARING STUDS OR THE LIKE

Donald H. Ettinger, Royal Oak, Mich., assignor to Warren Fastener Corporation, Mount Clemens, Mich.

Filed Feb. 28, 1972, Ser. No. 230,015
Int. Cl. B23k 9/20
U.S. Cl. 219—98 7 Claims



A stud retaining collet enables a welding gun successively to receive and hold in welding position studs or the like having circumferentially enlarged head portions. The improved collet, especially useful in arc welding, has a base which, with an associated mechanism of the gun, effects non-spurting stud retention against forces feeding the studs and also is able to conduct the welding current to the stud.

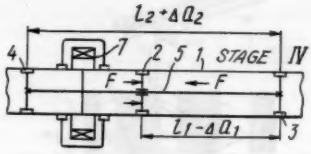
3,723,701
METHOD OF FLASH BUTT WELDING OF ARTICLES

Viktor Senderovich Lifshits, Kavkazsky bulvar, 21, korpus 2, kv. 41, Moscow; Viktor Ivanovich Grigoriev, poselok Lvovsky, Sadovy proezd. 4, kv. 47, Moskovskaya; Georgy Nikolaevich Petrov, Izmailovsky bulvar. 34/32, kv. 8, Moscow, and Oleg Sergeevich Papkov, Samarkandsky bulvar, 24, korpus 3, kv. 3, Moscow, all of U.S.S.R.

Filed March 23, 1971, Ser. No. 127,122
Int. Cl. B23k 9/00
U.S. Cl. 219—100 1 Claim

A method of flash welding of two elongated parts secured in clamps which consists in essence in that elastic energy is

stored in one of the parts to be welded and in a welding machine element connecting two clamps in which said part is



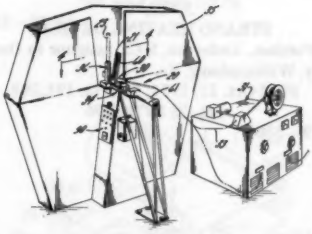
secured, and the energy thus stored is employed to bring together the parts to be welded during the welding procedure.

3,723,702

AUTOMATIC ASSEMBLING AND WELDING MACHINE

Howard W. Clay, Rockford, Ill., assignor to Sterling Radiator Company, Inc., Rockford, Ill.

Filed Feb. 24, 1972, Ser. No. 228,908
Int. Cl. B23k *9/12*
U.S. Cl. 219—124 **7 Claims**



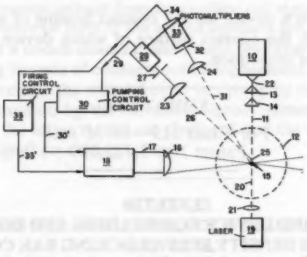
The machine automatically inserts tubes one-by-one into holes spaced along a manifold pipe and, after insertion of each tube, welds the tube at right angles to the pipe.

3,723,703

LASER ENERGIZED PLASMA SOURCE

Kenneth W. Ehlers, Alamo, Calif.; Ian G. Brown, Munich, Germany, and Alan F. Lietzke, Oakland, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 8, 1971, Ser. No. 113,522
Int. Cl. B23k *27/00*
U.S. Cl. 176—1 **7 Claims**



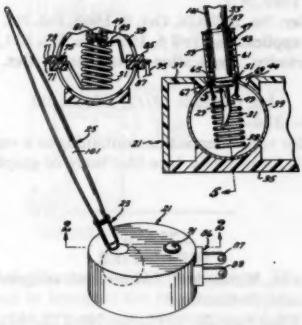
An apparatus for creating and heating a plasma within a magnetic field. A solid pellet of material from which the plasma is to be made, such as a frozen pellet of hydrogen, is dropped into a magnetic containment field. A high power laser directed through the field is activated to highly energize the hydrogen. The laser beam is concentrated at a focal point so that maximum energy is transferred to the pellet. The pellet falls within a steady-state laser beam directed vertically through the focal point. The laser is pumped and fired when the pellet is in the focal point by signals from photomultipliers which detect the presence of a pellet just above the focal point.

3,723,704

CAUTERY APPARATUS

John D. Silverthorne, 3330 Marna, Long Beach, Calif.

Filed Dec. 11, 1970, Ser. No. 97,161
Int. Cl. A61b *17/38;* **H05b** *1/02, 3/02*
U.S. Cl. 219—242 **7 Claims**



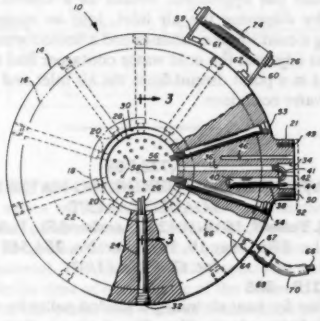
Cautery apparatus including a base for mounting an elongated pen-shaped cautery tool formed on one end with a long, narrow tip constructed of metal having good heat retention characteristics. The base includes an electrical heater and has a retractor mounted thereon for receipt of the cautery tool and shiftable from a heating position to carry the tool from a position holding the tip adjacent the heater to a retracted position moving the tip away from the heater. The retractor is biased to its retracted position and a thermally responsive retainer is engageable with such retractor to hold it in the cautery heating position and is responsive to a predetermined temperature to release the retractor to be returned to its retracted position.

3,723,705

FUSION HEATER

William F. Province, Bartlesville, Okla., assignor to The Ridge Tool Company, Bartlesville, Okla.

Filed Jan. 17, 1972, Ser. No. 218,272
Int. Cl. H05b *1/00*
U.S. Cl. 219—243 **7 Claims**



An electrical fusion heater for heating the abutting ends of two plastic pipes to be joined in a plastic pipe fusion apparatus. The heater comprises a thick circular slab of good heat conductivity metal with an outer diameter greater than

the diameter of the largest pipe size to be heated, and with a central opening smaller than the smallest pipe size to be heated. A plurality of heater elements are inserted into a corresponding plurality of radial openings along the central plane of the heater plate. A thermostatic switch is inserted into another opening in the central plane and connections between the power cable, the heater elements and the switch are made up in the central opening.

3,723,706
WICK TYPE EVAPORATOR

Johannes Jacobus Asuerus Ploos Van Amstel, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

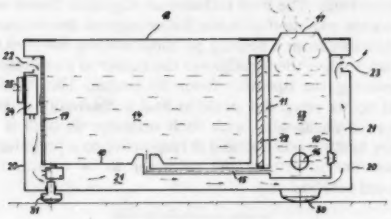
Division of Ser. No. 765,826, Oct. 8, 1968, Pat. No. 3,607,368.
This application April 6, 1971, Ser. No. 131,793
Claims priority, application Netherlands, Oct. 10, 1967, 6713713
Int. Cl. C23c *13/12*; **H05b** *1/00*
U.S. Cl. 219—274 **2 Claims**

A device for vapor deposition containing as a vaporizer element, a wick formed of a lace-like body of graphite or carbides.

3,723,707
HUMIDIFIER

Max Wunderlin, Mannedorf, Switzerland, assignor to Turmix AG, Kusnacht, Switzerland

Filed Aug. 20, 1971, Ser. No. 173,461
Int. Cl. F22b *1/28*
U.S. Cl. 219—276 **5 Claims**



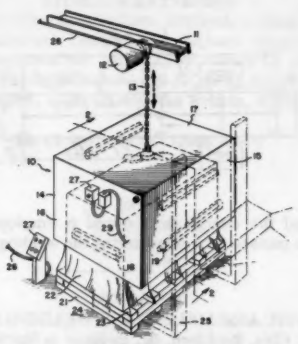
A humidifier having automatic control means respective to the degree of moisture in the air of the space to be humidified is provided with a hygrostatic switch located directly on the humidifier, thus dispensing with wiring connections between the humidifier and a hygrostatic switch located at a distance therefrom. A current of air from the space to be humidified is drawn past the hygrostatic switch as a convection current caused by disposing the air inlet, into an outer casing surrounding a cold water container and a heated water container, at a point adjacent the cold water container and disposing the air outlet at a point distant from the air inlet and adjacent the heated water container.

3,723,708
APPARATUS FOR HEAT SHRINKING MATERIAL ABOUT LOADED PALLET

Martin J. Tulkoff, 1010-1042 E. Lombard St., Baltimore, Md.

Filed May 18, 1972, Ser. No. 254,548
Int. Cl. F27d *11/02*
U.S. Cl. 219—385 **6 Claims**

A device for heat shrinking a loaded pallet having a bag of heat shrinkable plastic film. The device includes a housing which is closed at its sides and top but is open at the bottom. Along the internal walls are positioned heating elements which consume only a moderate amount of electric energy. The housing is suitably insulated to conserve heat and thereby reduce electric energy requirements. The housing has means associated therewith to permit its being raised and lowered; so

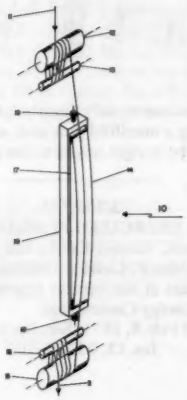


that in non-use the housing is raised into an out-of-the-way position.

3,723,709
STRAND HEATING DEVICE

J. Harold Forshee, Anderson, S.C., assignor to Dow Badische Company, Williamsburg, Va.

Filed Oct. 21, 1971, Ser. No. 191,293
Int. Cl. F27b *9/06*
U.S. Cl. 219—388 **1 Claim**



Disclosed is a device for the contact heating of a traveling textile strand, the contact surface of which device is readily removable for renovation.

ERRATUM

For Class 219—69 M see:
Patent No. 3,723,690

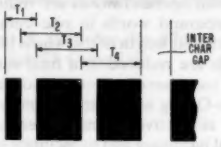
3,723,710
METHOD AND DEVICE FOR READING AND DECODING A HIGH DENSITY SELF-CLOCKING BAR CODE

William G. Crouse, and John E. Jones, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1971, Ser. No. 157,158
Int. Cl. G06k *7/10*; **E04g** *17/00*
U.S. Cl. 235—61.11 E **19 Claims**

A high density self-clocking multiple bar code is scanned to determine the displacement of adjacent leading edges of the

bars and of the adjacent trailing edges of the bars. The detected leading and trailing edge displacements are compared



with a standard identifiable displacement included in all of the valid codes and are categorized with respect thereto and the sequential categories thus derived define the encoded data.

3,723,711

METER PARTICULARLY MEASURED QUANTITY READ-OUT DEVICE THEREFOR

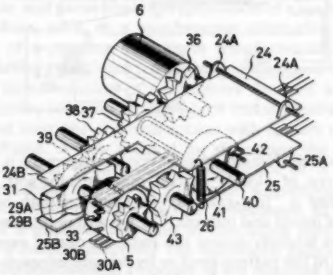
Takeshi Kamata, Kahaku-ku, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 20, 1971, Ser. No. 145,252

Claims priority, application Japan, May 25, 1970, 45/44010

Int. Cl. G06m *1/276*

U.S. Cl. 235—92 EA **10 Claims**



A measured quantity readout device for use with flowmeters and the like comprising means for producing electrical signals indicative of the measurement of a predetermined quantity of flow; a motor adapted to be actuated by the electrical signals and driving a digit wheel which is provided with coded elements on its periphery for indicating the quantity of flow; two sets of contacts mounted on respective support plates and urged toward each other by a spring such that each engages the digit wheel in diametrically opposed positions on its outer periphery to sense the presence or absence of the coded elements; output lines for reading out signals indicating whether either or both of the sets of contacts are closed by the sensing of a coded element; and means operated by the motor for urging the sets of contacts out of engagement with the digit wheel to render the wheel free to be driven by the motor during its actuation by the electrical signals. Alternate embodiments of the latter means are disclosed and the details of one form of signal-producing means.

3,723,712

METHOD FOR AGGLOMERATION MEASURING AND CONTROL

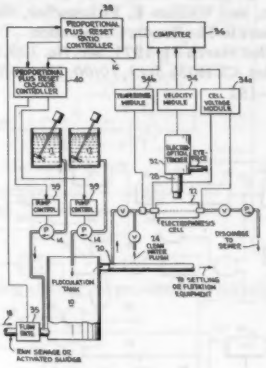
Thomas R. Komline, Sr., Gladstone, and Walter R. Wills, Cedar Knolls, both of N.J., assignors to Komline-Sanderson Engineering Corporation, Peapack, N.J.

Filed Oct. 12, 1971, Ser. No. 188,516

Int. Cl. G06f *15/46;* **G01n** *21/28, 33/16*

U.S. Cl. 235—151.31 **6 Claims**

The apparatus extracts samples of a fluid stream containing colloidal suspended solids at a detection station wherein the electrophoretic mobility (EM) of the colloidal suspended solids is determined. The detection station automatically measures the EM and provides such data to a computer, which computes the Zeta Potential. The computer also receives other information relating to the characteristics of the colloidal suspended solids, such as temperature, the percent of



solids, and the flow rate of the fluid system. The computer is programmed to interpret the input data and to provide corrective signals to processing apparatus which automatically adjust and control the additives fed into the fluid stream to achieve automatic flocculation correction so that the agglomeration of the colloidal suspended solids in the fluid stream is optimized.

3,723,713

MASS MEASUREMENT SYSTEM FOR MASS SPECTROMETERS

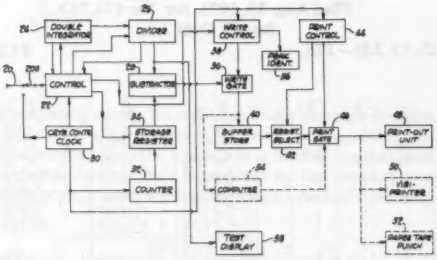
Aubrey E. Banner, Sale, and Thomas O. Merren, Hale, both of England, assignors to Associated Electrical Industries Limited, London, England

Filed April 14, 1970, Ser. No. 28,468

Claims priority, application Great Britain, April 15, 1969, 19,199/69

Int. Cl. G06g *7/74;* **B01d** *59/48*

U.S. Cl. 235—151.35 **36 Claims**



In a scanning mass spectrometer, electrical output signals including a series of time-related peaks representing an ion mass spectrum of an unknown sample material are produced along with a series of reference peaks derived from a reference material. The time at which a spectrum peak occurs is taken to be the time of occurrence of the centroid (or center of gravity) of the peak. The time of occurrence of the peak centroid in relation to the time of occurrence of the end of the peak is determined and that information is presented in digital form. The occurrence time of the peak centroid is then subtracted from the occurrence time of the peak to provide the peak centroid occurrence on the scan. Thus, the time posi-

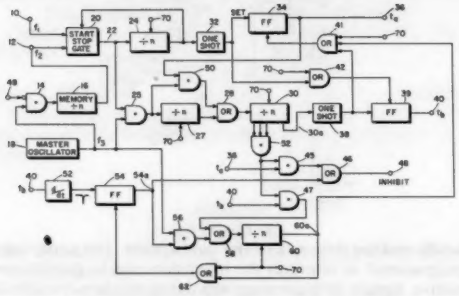
tions of the peak centroids due to an unknown sample may be readily identified with respect to the time positions of the centroids of peaks due to the reference material.

3,723,714

DIGITAL PHASE TRACKER

Harold W. Jackson, Baltimore; Merlin E. Olmstead, Manchester, and William E. Fickenscher, Baltimore, all of Md., assignors to The Bendix Corporation

Filed March 31, 1971, Ser. No. 129,720
Int. Cl. H03k *5/13, 19/00;* **H04j** *3/06*
U.S. Cl. 235—152 **13 Claims**



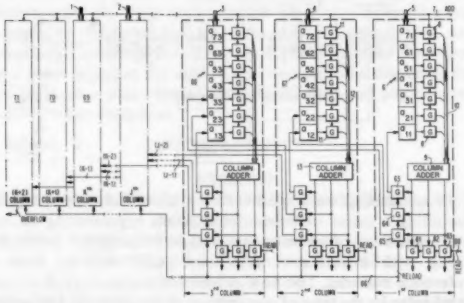
A digital phase tracker includes a memory for storing a signal locked in phase with an external signal and means for maintaining the signal stored within the memory phase synchronized with the external signal as the phase of the external signal varies. The time relationship between positive excursions of the external signal and positive excursions of the stored signal is timed by high-speed clock pulses with clock pulses being added to or subtracted from the memory signal to maintain phase-lock.

3,723,715

FAST MODULO THRESHOLD OPERATOR BINARY ADDER FOR MULTI-NUMBER ADDITIONS

Tien Chi Chen, San Jose, Calif., and Irving T. Ho, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 25, 1971, Ser. No. 174,753
Int. Cl. G06f *7/50*
U.S. Cl. 235—175 **8 Claims**



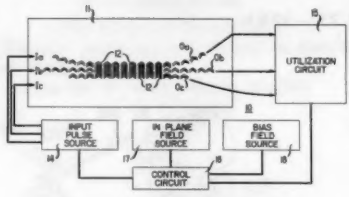
A fast adder for adding more than three words, the correspondingly weighted bits of which are applied to respective bit column adders. The column adders simultaneously produce respective sum and carry result bits of overlapping positional significance or weight. The maximum number of result bits having the same weight is determined by the quantity of words to be added at the same time (which establishes the number of bits in each bit column). In the disclosed embodiment, seven words are added at a given time and no more than three of the generated result bits have the same weight. In effect, the seven operand words are reduced to a subtotal of three result operand words in one computational cycle irrespective of the bit length of the words being added. The subtotal operands are reduced to a final sum by application to conventional carry save and carry look-ahead adders. Equal weighted wire-ORing and matrix memory techniques are employed in the respective column adders to conserve required computational hardware and to facilitate large scale circuit integration.

3,723,716

SINGLE WALL DOMAIN ARRANGEMENT INCLUDING FINE-GRAINED, FIELD ACCESS PATTERN

Andrew Henry Bobeck, Chatham, and Henry Evelyn Derrick Scovil, Gladstone, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 8, 1971, Ser. No. 160,841
Int. Cl. G06f *7/50;* **F11c** *11/14;* **G11c** *19/00*
U.S. Cl. 235—176 **20 Claims**



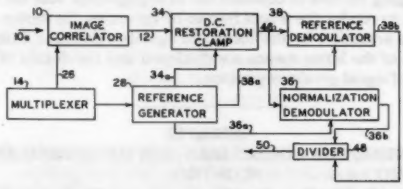
A single wall domain propagation arrangement is provided by a pattern of closely spaced magnetically soft elements which define a "fine-grained" propagation path between a plurality of inputs and outputs. The pattern permits movement of domains laterally across the path, an option exercised by the design of the pattern itself or by domain interaction. When lateral movement is employed, the output at which a domain occurs is a logical function of the input and a full adder operation may be realized.

3,723,717

METHOD AND APPARATUS TO EFFECT NORMALIZED CORRELATION

James J. Hogan, Akron, and Thoedore W. Iler, Tallmadege, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed July 26, 1971, Ser. No. 166,153
Int. Cl. G06g *7/19;* **H01n** *5/30*
U.S. Cl. 235—181 **10 Claims**

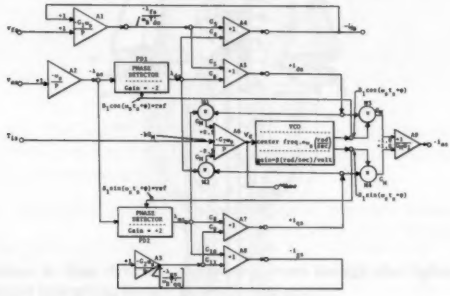


An electronic area correlator is pulsed into cut-off and uniform transmission modes to provide a sequentially time-shared signal containing reference, correlation, and integral information. This time-shared signal is separated, demodulated, and electronically combined to provide a normalized output signal that readily identifies the correlation match-point.

3,723,718
SIMULATION THROUGH ROTATING COORDINATE TRANSFORMATION

Richard M. Jaffe, and Robert B. Parente, both of Los Angeles, Calif., assignors to System Development Corporation, Santa Monica, Calif.

Filed Nov. 9, 1970, Ser. No. 87,931
Int. Cl. G06g *7/62*
U.S. Cl. 235—185 **36 Claims**



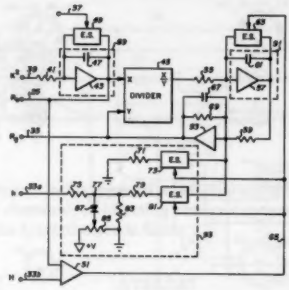
There is disclosed herein novel simulation of power system components, and particularly the simulation of a rotating electrical machine, such as a synchronous alternator, through utilization of a rotating coordinate transformation. A new form of rotating coordinate transformer is disclosed for calculating the transformation of coordinates between a primary and a secondary reference frame which rotate relative to each other and at least one of which rotates with respect to a fixed reference frame. A new method for simulating the dynamic electromechanical behavioral characteristics of a rotating electrical machine, such as an alternator, a synchronous motor, induction machine, and the like, is disclosed, as well as a new use of a phase-locked-loop in simulating such characteristics of a rotating machine. The behavioral characteristics are the electromechanical response of the machine as a function of electrical and mechanical inputs thereto and the parameters of the machine. An exemplary simulation is disclosed employing a coordinate transformer in the form of a modulated oscillator circuit, such as a voltage controlled oscillator, and a demodulator circuit, such as a phase detector. Feedback may be employed with these circuits to form one or more phase-locked-loops. A new simulation system is disclosed, as well as a method for simulating the rotation of the rotor of an electrical machine. Also a method for simulating the reference of a stator electrical variable of the machine to the rotor thereof or visa versa is disclosed. Additionally, an extensive analysis of alternators and the characteristics thereof from a mathematical standpoint are disclosed.

3,723,719
GROUND RANGE COMPUTER

Wei L. Chen, Sunnyvale, and John R. Carter, San Jose, both of Calif., assignors to The Singer Company, Binghamton, N.Y.

Filed Feb. 3, 1972, Ser. No. 223,070
Int. Cl. G06g *7/22, 7/36*
U.S. Cl. 235—190 **7 Claims**

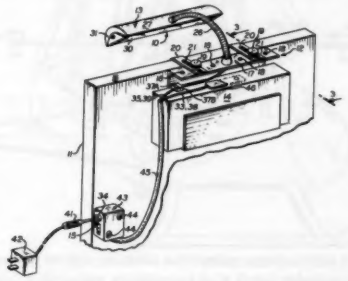
The disclosed embodiment of the present invention is a device for use in aircraft flight simulators which computes, as a function of time, ground range from the aircraft's nadir to an object in front of the aircraft, when given the aircraft's altitude and the slant range to the object. The relationship between ground range, altitude and slant range is essentially a right triangular and can be expressed mathematically by he P ythagorean Theorem. The mathematical expression for the right triangle is differentiated with respect to time and rearranged into an integral equation for solution of the ground range variable. Integrating and dividing circuitry is provided for implementation of the integral equation. Also, compensation and switching circuitry is provided for initialization of the integrators.



3,723,720
ILLUMINATING DEVICE FOR DISPLAY FRAME

Joseph Schmidt, New York, N.Y., and Aladar Heppes, Ridgefield, Conn., assignors to Magna Battery Reflector Corp., New York, N.Y.

Filed July 23, 1971, Ser. No. 165,664
Int. Cl. F21v *33/00*
U.S. Cl. 240—2 R **4 Claims**



An illuminating device for a display frame having a bracket that is adjustable to grip different sizes of frames, a lamp adjustably supported from the bracket by a flexible conduit, and a rechargeable battery pack supported by the bracket and electrically connected to the lamp through a remote operating switch.

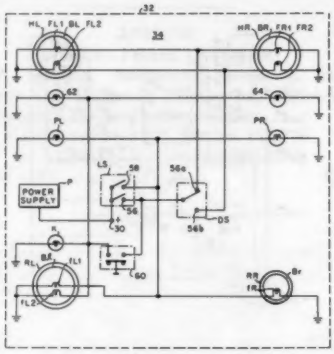
3,723,721
LIGHTING SYSTEM FOR MOTOR VEHICLES

Martin Weber, Grossingersheim, Germany, assignor to S.W.F-Spezialfabrik For Autozubeeor Gustav Rau GmbH, Bietigheim, Germany

Filed Feb. 11, 1971, Ser. No. 114,560
Claims priority, application Germany, Feb. 21, 1970, P 20 08 300.2
Int. Cl. B60q *1/20, 1/24*
U.S. Cl. 240—7.1 A **10 Claims**

In the automobile lighting system disclosed, a rear lamp in-

cludes two filaments. One of the filaments is turned on along with the parking lights and headlamps. A fog lamp switch



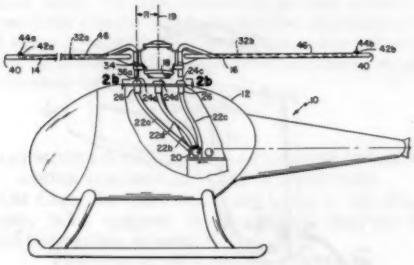
completes a circuit to energize the second filament. The latter produces a more powerful light than the first filament.

3,723,722

HELICOPTER LIGHTING

Theodore J. Van Iderstine, Peabody, and Leonard J. Bonnell, Medford, both of Mass., assignors to Dyonics, Incorporated, Woburn, Mass.

Filed Sept. 14, 1970, Ser. No. 72,010
Int. Cl. B64d *47/02*
U.S. Cl. 240—7.7 **27 Claims**



Relatively rotatable elements coupled for light transmission by fiber optic devices analogous to electrical commutators.

A rotary wing aircraft embodiment employing fiber optics in the rotor blade for navigational lights has a flexible light pipe extension from the blade with an end fixed to move with the driving assembly in a set circular path, to sweep by and pick up light from a light source on the body. Other portions of the extension flex to follow cyclic pivoting of the blade relative to its driving assembly. Fibers in the blade are arranged to bend with the blade during operation by use of a flexible light pipe within which the fibers adjust relative to one another during blade bending. Heat-curing of plastic about a heat resistant flexible light pipe and bonding the fibers directly into the blade matrix as bendable strength element using a thin, wide and long ribbon of optical fibers are shown. Light sources on the body of the aircraft are shown as fiber light pipes with ends fixed to be swept by the pickup pipes. Four source light pipes provide light in accordance with navigational rules, a rotor blade receiving alternately white, green, white, red light as it rotates through various sectors. A Maxwellian lens at the end of a source light pipe defines an extended lighted arc along the pickup path, to provide extended duration of light transmission in each sector, the lens also enabling variation in the physical position of the blade assembly as occurs in the field.

3,723,723

CHRISTMAS TREE ELECTRIC LIGHT DECORATION SET

Charlotte F. Lerner, Brooklyn, N.Y., assignor to Small World Importing Corp., New York, N.Y.

Filed Jan. 4, 1971, Ser. No. 103,674
Int. Cl. A47g *33/16*
U.S. Cl. 240—10 T **15 Claims**

The light set comprises a plurality of strings of miniature lamps permanently joined in parallel circuit, each with respect to the others, at a pair of junctions which can be mounted at an upper portion of a Christmas tree. The string of lamps drape downwardly in free fall fashion at different radiant angles relative to the axis of the tree. The strings of lamps may comprise series connected or parallel converted lamps. The junctions of the strings of lamps are housed in an insulated casing which can be a socket connector to which a tree top lamp extension cord is disconnectably connected; or the tree top extension cord may be permanently connected to the parallel connected strings of lamps, at said junctions. A flasher lamp may be added in series with the series connected lamps of each string. The parallel connected lamps (of the strings of parallel connected lamps) may all be flasher lamps. Lead wires are permanently joined at said pair of junctions, and connect to a plug for insertion in a wall outlet. In light sets in which the strings of lamps comprise parallel connected lamps, the lead wires may also carry parallel connected lamps.

3,723,724

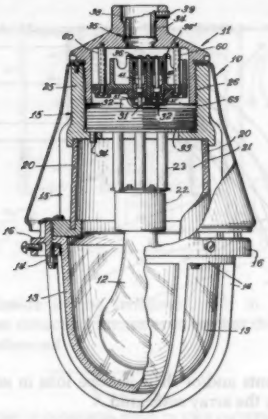
SAFETY MOUNTED EXPLOSION PROOF LIGHT FIXTURE

Arthur I. Appleton, 1 Bridlewood Road, Northbrook, Ill.

Filed June 27, 1969, Ser. No. 837,099
Int. Cl. H01h *19/06*
U.S. Cl. 240—11.2 E **3 Claims**

Light bulbs in a safety-fixture which includes an enclosure of glass or other translucent material, are replaced after removing the fixture from its mounting. As the fixture is mated with the mounting, it moves through a sufficient distance to pass the fixture through three distinct zones; a first zone in which the fixture and mounting form a first explosion-proof enclosure therebetween; a second zone in which non-energized electrical connectors of the mounting and fixture engage; and a third zone in which the non-energized electrical connectors become energized by switch means on the housing, within the first enclosure. Withdrawal of the fixture from the third to the second zone automatically causes the connectors to be de-energized by the switch means. Making and breaking of electrical connection with live contacts only takes

place within a second explosion-proof enclosure in the switch means. The danger of arcing during replacement of bulb or



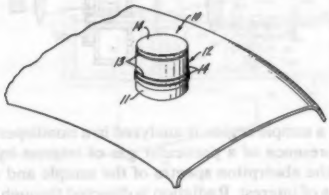
fixture is thus virtually eliminated, even though the lighting circuit energizing fixture is, itself, energized.

3,723,725

BEACON SIGNALING DEVICES

Robert O. Jaeger, Palatine, Ill., assignor to Unity Manufacturing Co., Chicago, Ill.

Filed Dec. 9, 1969, Ser. No. 883,430
Int. Cl. F21v 9/08
U.S. Cl. 245—46.59 **7 Claims**



An improved beacon signaling device having an effective balance between signal brightness and color identification is provided by placing transparent apertures on the colored housing enclosing the light producing assembly of such beacons so that light passing through the transparent apertures retains its original brightness while light passing through the colored areas of the housing have reduced brightness but retained color identity.

ERRATUM

For Class 246—468 see:
Patent No. 3,723,728

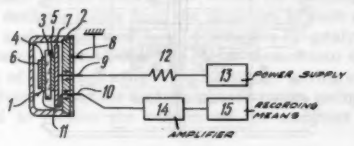
3,723,726

DEVICE WITH DIAMOND DETECTOR WITH NEUTRON DETECTION

Stanislav Fedorovich Kozlov, Moscow, U.S.S.R., assignor to Fizichesky Institut Imeni P.N. Lebedeva Akademii Nauk SSSR, Moscow, U.S.S.R.

Filed Oct. 3, 1969, Ser. No. 863,614
Claims priority, application U.S.S.R., Oct. 3, 1969, 1274217
Int. Cl. G01t 3/00
U.S. Cl. 250—83.1 **3 Claims**

A device for neutron detection, comprising in combination with a radiator a nuclear radiation detector on the basis of a diamond crystal plate with contacts formed at the opposite sides thereof, one of which contacts is made blocking in relation to charge carriers and is provided with said radiator, while



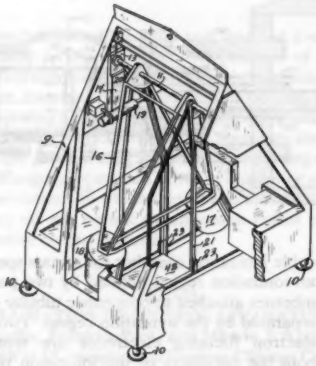
the opposite contact is made of a material capable, in conjunction with a diamond, of injecting charge carriers under the influence of an applied electric field.

3,723,727

IN-SITU NEUTRON ACTIVATION

Ned A. Wogman; Richard W. Perkins; Henry G. Rieck, and John A. Cooper, all of Richland, Wash., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed June 30, 1971, Ser. No. 158,309
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 **1 Claim**



A probe for in-situ neutron activation analysis has a neutron source and a detector positioned in a fixed relationship. The material being analyzed is irradiated by the neutron source and then the detector is moved over the material for analysis. At all times the fixed spaced-apart relationship of the detector and the neutron source is maintained. The probe is particularly adapted for analysis of materials in inaccessible places such as the sea floor and includes a pressure plate for maintaining the material being analyzed in a fixed location during the analysis.

3,723,728

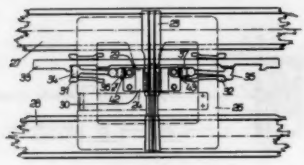
CROSSING FROG WITH A MOVABLE FROG POINT

Ernst von Hayn, Butzbach/Oberhesson, Germany, assignor to Butzbacher Weichenbau Gesellschaft mbH, Butzbach/Oberhessen, Germany

Filed Dec. 30, 1970, Ser. No. 102,602
Claims priority, application Germany, Jan. 17, 1970, P 20 02 025.1
Int. Cl. E01b 7/10
U.S. Cl. 246—468 **6 Claims**

A frog point of a crossing frog supports a freely suspended support plate such that relative longitudinal movement between the frog point and the support plate is provided. The support plate carries clamp members which are engageable

with a drive rod and with locking boxes so as to transport the frog point transversly between stationary longitudinal wing



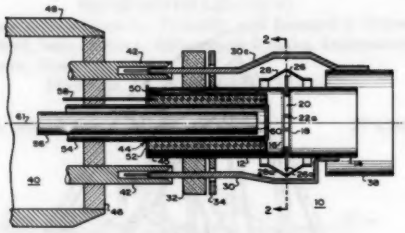
rails and lock the frog point in abutment positions with the wing rails.

3,723,729

IONIZATION CHAMBER FOR USE WITH A MASS SPECTROMETER

William P. Kruger, Los Altos Hills, and Wilson R. Turner, Los Gatos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 2, 1971, Ser. No. 111,910
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 SB **8 Claims**



A replaceable ionization chamber for a mass spectrometer comprises an ionization region defined by two parallel perforated membranes attached to concentric tubular electrodes which are separated by the ionization region. Two filaments and two electron focusing electrodes are symmetrically disposed about the periphery of the ionization region, and sample input ports are similarly disposed about the periphery. An ion focusing electrode is mounted at the output end of the chamber. The components of the ionization chamber are supported by a plurality of conductive rods which are, in turn, supported by an insulating ring. The ionization chamber mates with a socket having a plurality of receptacles for selected ones of the conductive rods and a tubular section containing heating and cooling elements.

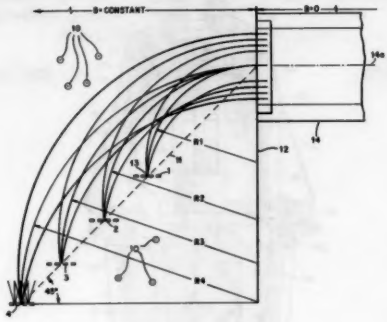
3,723,730

MULTIPLE ION SOURCE ARRAY

Frank J. Gordon, Livermore, and Charles C. Damm, Alamo, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 30, 1971, Ser. No. 203,352
Int. Cl. H01j *37/08*
U.S. Cl. 250—41.9 C **5 Claims**

A plurality of Calutron ion sources spaced in a linear array at a 45° angle to a 90° the plane i.e., the plane parallel to the field lines of a uniform magnetic field into which the source beams are directed, and normal to the injection axis of the ion receiving device such as an accelerator column, at the entry thereto. The sources are contained in a common vacuum and respectively operated at a proper potential with respect to the strength of the magnetic field for each beam to enter a single beam accelerator presented at the plane, at a suitable relatively small acceptance angle, e.g., of the order of ±3°. Not only may the array be employed to introduce a very high current beam to the accelerator column, but a composite beam of



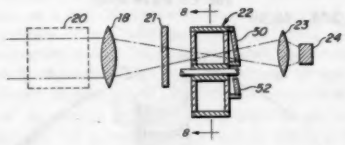
various elements and/or their isotope ions in admixture may be supplied by the array as desired.

3,723,731

ABSORPTION SPECTROSCOPY

Henry H. Blau, Jr., Wayland, Mass., assignor to Environmental Research & Technology, Inc., Lexington, Mass.

Filed March 18, 1971, Ser. No. 125,615
Int. Cl. G01n *21/24, 21/34*
U.S. Cl. 250—43.5 R **20 Claims**



Gas in a sample region is analyzed in a nondispersive system for the presence of a particular gas of interest by cross-correlating the absorption spectra of the sample and a specimen of the gas of interest. Radiation is directed through the sample region and a filter for isolating a narrow band of frequencies within the absorption band of the gas of interest, to a radiation detector. The radiation is passed through cells that provide the total energy transmitted at the line or lines of interest and a reference energy transmitted by a region adjacent to the lines of interest and unaffected by changes in absorption in the sample region. In one embodiment this is accomplished by passing the radiation from the filter in rapid succession through three cells typically containing, respectively, an inert gas, the gas of interest at a pressure of about one atmosphere and the gas of interest at approximately two atmospheres pressure, to produce three signals which are combined by a conventional electronic system to give the fractional absorption of the gas of interest in the sample region. an interferometer containing in one leg, a cell containing the gas of interest at a pressure of about two atmospheres, may be located in the radiation path between the cells and the detector.

3,723,732

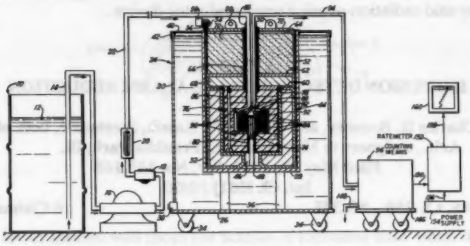
ON-STREAM ANALYSIS

John G. Larson, Pittsburgh, and John M. Orange, Jeannette, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 24, 1971, Ser. No. 146,122
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 MR **17 Claims**

The preferred form of the invention comprises a relatively small Cf–252 radioactive source positioned within a coil ir-

radiator, specifically for the detection of vanadium in hydrocarbon streams. The sample flow is from the outside



towards the inside in the irradiator, and in the opposite direction in the detection means coil, so that decay counting efficiency is enhanced.

3,723,733

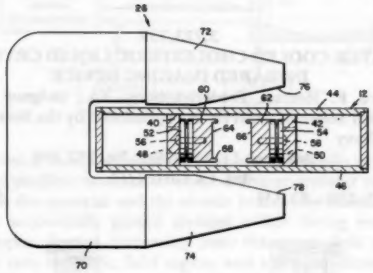
STIGMATIC, CROSSED-FIELD VELOCITY FILTER

Robert L. Seliger, Agoura, and Robert G. Wilson, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 12, 1971, Ser. No. 142,716

Int. Cl. H01j *37/26, 29/76*

U.S. Cl. 250—49.5 T **13 Claims**



A stigmatic, crossed-field velocity filter for nondeflection purification of an ion beam employs shaped electrodes to increase the uniformity of the electric field and employs shaped magnetic pole pieces to produce a nonuniform magnetic field for stigmatic passage of the selected ion species through the filter.

3,723,734

INDICATING OR DETECTING APPARATUS FOR NUCLEAR RADIATION SUCH AS GAMMA RAYS

George Christopher Loveday, Leigh-on-Sea, England, assignor to Pye Limited, Cambridge, England

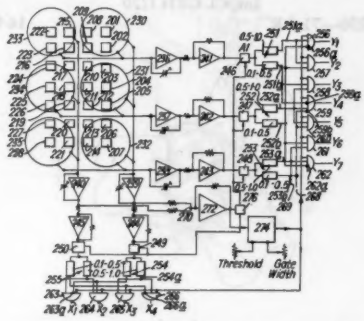
Filed Dec. 1, 1970, Ser. No. 93,946

Claims priority, application Great Britain, Dec. 3, 1969, 59,102/69

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R **15 Claims**

A nuclear radiation detecting or indicating apparatus comprises a mosaic of optically separate scintillator elements which are arranged in a series of first and second elements rows respectively parallel to first and second intersecting axes, each element being in a first and in a second row; a plurality of scintillation detectors arranged to view the scintillation elements, the detectors being more widely spaced from each other than are the elements, and being arranged in first and second detector rows, parallel to the first and second element rows, each detector being in a first and a second detector row, each detecting being adapted to produce a detector pulse in response to a scintillation detected thereby, the amplitude of the pulse being dependent on the position of the scintillation relative to the detector; a respective first output channel for each first element row, and a respective second output channel for each second element row; means for summing simultaneous detector pulses from the detectors in each detector row; an analyzer for each row of detectors for analyzing the simultaneous summed detector pulses thereof into one of a plurality of amplitude ranges, each analyzer having a respective analyzer output for each amplitude range; gating means arranged to receive the outputs of the analysers and to



produce simultaneous pulses in a said first and a said second output channel in response to a scintillation of brightness within a predetermined range, thereby in operation defining the element in which said scintillation occurs; the gating means comprising a plurality of logic gates, at least one pair of which is connected in common to at least two analyzer outputs, the logic gates of said at least one pair being adapted to respond differently from each other to a pulse or pulses from the analyzer outputs to which they are connected in common, so that they do not permit simultaneous pulses to occur in their respective output channels.

3,723,735

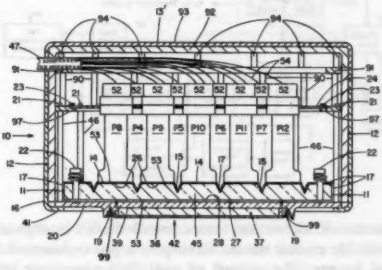
RADIATION DETECTING APPARATUS

David J. Spelha, Franklin Park, and Marvin J. Kreuser, North Lake, both of Ill., assignors to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Feb. 1, 1971, Ser. No. 111,409

Int. Cl. G01t *1/20*

U.S. Cl. 250—71.5 R **10 Claims**



An improved light guide for use in a radiation detecting apparatus. The areas of the surfaces of the light guide not in contact with the photomultiplier tubes or the scintillating crystal assembly are covered with a highly light absorbent coating, such as black paint. In the preferred form, V-shapped indentations extend into the surface of the light guide and encircle the light sensitive faces of the photomultiplier tubes about the periphery thereof. These V-shaped indentations are also

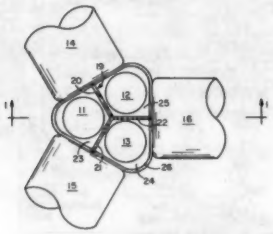
coated with a light absorbent coating. This improvement in the construction of the light guide reduces greatly the occurrence of "hot spots", which are recordations in a two-dimensional co-ordinate system of inordinately large concentrations of light that are not actually present at certain spots in the radiation source.

3,723,736

MULTIPLE SAMPLE COINCIDENCE COUNTER

Barton H. Laney, Deerfield, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed May 11, 1971, Ser. No. 142,292
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **16 Claims**



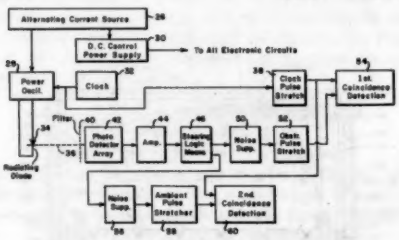
In a liquid scintillation coincidence counting apparatus, the improvement wherein multiple radioactive samples are analyzed simultaneously using a counting chamber divided into sections by partition means. Each section of the chamber accomodates a sample and is in visual communication with at least two and less than all of the photomultiplier tubes. The coincidence detection system passes electrical pulses only when coincident electrical pulses are received from all of the photomultiplier tubes in visual communication with a single section of the chamber.

3,723,737

INFRARED DETECTION AND CONTROL DEVICE

Maurice I. Zeldman; Edward J. Walker, and Suresh K. Gupta, all of Pittsburgh, Pa., assignors to North America Rockwell Corporation, Pittsburgh, Pa.

Filed May 18, 1971, Ser. No. 144,518
Int. Cl. G01j *1/00*
U.S. Cl. 250—83.3 H **6 Claims**



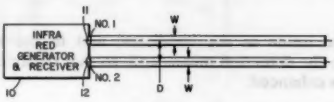
An electronic detection and control device comprising a first electronic circuit means having its input connected to an electrical source, the output of said first electronic circuit means connected to at least one radiation-emitting semiconductor device, said first electronic circuit means adapted to provide electrical energy to said semiconductor device to excite said semiconductor device to produce a radiated signal, said radiated signal defining a radiation screen, a radiation-sensing semiconductor device whose input is adapted to receive said radiated signal, the output of said radiation-sensing semiconductor device connected to a second circuit means, said second circuit means adapted to provide an output signal responsive to the presence or absence of any obstruction in said electronic screen, or responsive to the presence or absence of any ambient radiated energy received by said radiation-sensing semiconductor device.

3,723,738

INTRUSION DETECTION FALSE ALARM REDUCTION SYSTEM

Charles H. Brenner, and Ronald W. Kassik, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 20, 1971, Ser. No. 145,168
Int. Cl. H01j *39/00*
U.S. Cl. 250—83.3 H **6 Claims**



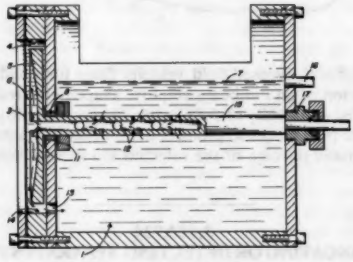
False alarm reduction means for an intrusion detection system are disclosed wherein two optical transmitting systems with highly directive beams alternately illuminate adjacent but non-overlapping cross-sections. A signal processor indicates true target detection only when the target return from two or more successive pulses exceed a predetermined threshold which implies that the target is sufficiently large that it intersects both beams.

3,723,739

WATER-COOLED CHOLESTERIC LIQUID CRYSTAL INFRARED IMAGING DEVICE

Richard F. Horton, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 11, 1971, Ser. No. 152,306
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 H **9 Claims**



An infrared imaging device for the detection and measurement of hazardous irradiances in a laser beam caused by atmospheric scintillation. The 10.6 micrometer field is displayed visibly through the use of cholesteric liquid crystals on a water-cooled mylar film.

3,723,740

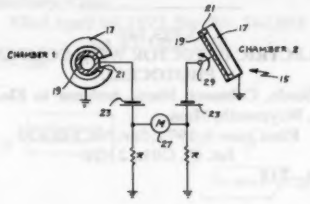
DIRECTIONALLY SENSITIVE RADIATION DETECTOR SYSTEM USING IONIZATION CHAMBERS

James A. Wall, Pinehurst, and Edward A. Burke, Woburn, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force

Filed April 29, 1971, Ser. No. 138,427
Int. Cl. G01t *1/18*
U.S. Cl. 250—83.6 R **3 Claims**

An X- and gamma radiation detector having two parallel spaced walls composed of materials of significantly different

atomic numbers. Any suitable sensitive medium between the walls may be utilized so as to produce a larger signal when the



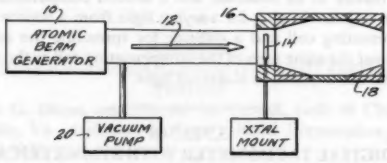
lower atomic wall faces the source of radiation than when the high atomic number material faces the source.

3,723,741

METHOD FOR EFFECTING NUCLEAR POLARIZATION OF A BEAM OF ATOMS

Dieter von Ehrenstein, Naperville, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 1, 1971, Ser. No. 177,058
Int. Cl. H01j 37/00
U.S. Cl. 250—84 **3 Claims**



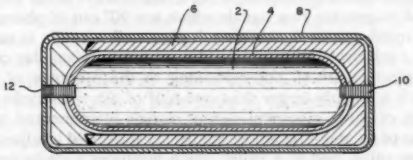
A beam of atoms is passed through a magnetically saturated mono-crystalline material to effect a charge-transfer reaction between the material and the atomic beam. The atomic beam is then sequentially passed through a first strong magnetic field region shaped decreasing from maximum field to zero field, a zero magnetic field region, and a second strong magnetic field region opposite in polarity to the first strong magnetic field region and shaped from zero field to maximum field to effect nuclear polarization of said atomic beam.

3,723,742

RADIOISOTOPE CAPSULE PROTECTION STRUCTURE

Jorge Aranguren, Playa Del Rey, Tex., and John C. Stansel, Palos Verdes, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed April 11, 1968, Ser. No. 721,140
Int. Cl. G21h 1/00
U.S. Cl. 250—106 **7 Claims**



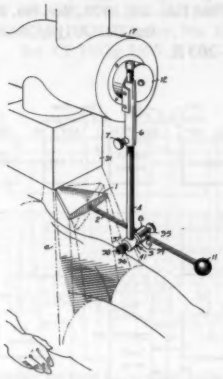
For safety reasons and to prolong the life of a radioisotope capsule and to increase the operating temperature, a radioisotope fuel is enclosed by an inner inert member and a high strength second member and an inert outer member. A vent is provided for release of the helium generated by isotope decay to avoid high pressure within the capsule.

3,723,743

ADJUSTABLE SHIELD DEVICE FOR SHIELDING X-RAYS

Dennis D. Brackenbrough, P.O. Box 266, Cutten, Calif.; Harold E. Godfrey, Jr., 1487 Allen Dr., Eureka, Calif., and Richard G. Mills, Rt. 1, Box 1, Bay Side, Calif.

Filed Nov. 26, 1971, Ser. No. 202,328
Int. Cl. G21f 3/00
U.S. Cl. 250—108 R **10 Claims**



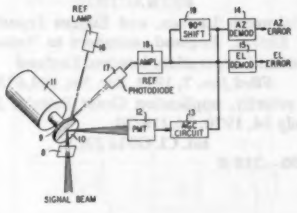
A generally triangular lead shield has a handle bar extended from its base slideably and rotatably through an adjustable head on the free end of a telescopic element, which latter is slideable and rotatable in a tube on a rotatable mounting bracket adapted to be secured to the housing of an X-ray tube, whereby the position of the shield can be adjusted vertically or horizontally or into an out of the way position, and the shadow area can be varied by turning the handle bar and the shield about a horizontal axis relatively to said X-rays.

3,723,744

OPTICAL TRACKER WITH VARIABLE DENSITY SPATIAL FILTER

Yen San Lim, Convent Station, and Mahadevan Subramanian, Whippany, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1970, Ser. No. 99,818
Int. Cl. G01c 1/00; G01b 11/26
U.S. Cl. 250—203 R **7 Claims**



An optical filter whose transmission coefficient increases monotonically with distance from the center of the filter is placed in front of the Image Position Sensor of an optical tracker. The optical tracker is of the type using a single photocell and a single chopper for both azimuthal and elevational channels. The center of the filter lies substantially on the optical axis of the system. Accordingly, the beam returning from a target being tracked by the optical tracker is attenuated according to its displacement from the axis of the system. The effect of this variable attenuation is to reduce the cross-coupling between azimuthal and elevational channels

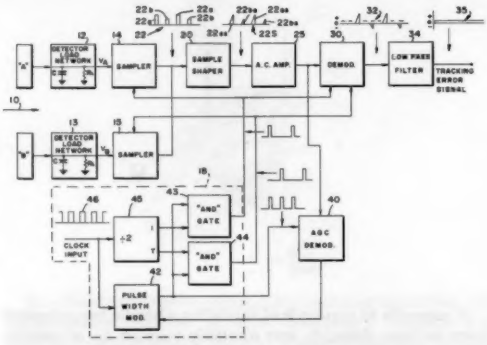
and to linearize the dependence of the error signals upon the respective components of target image displacement.

3,723,745

RADIANT SOURCE TRACKER INDEPENDENT OF NON-CONSTANT IRRADIANCE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration in respect to the invention of, and Fred D. Campbell, Los Angeles, Calif.

Filed Dec. 28, 1971, Ser. No. 212,900
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 R **15 Claims**



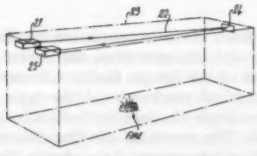
A tracker of a radiant source is disclosed, comprising a sectored matrix of detectors whose output voltages correspond to their respective levels of irradiance. The voltages are each sampled during a variable length period and the resulting samples are shaped into triangular samples by an integration process. They are supplied to a demodulator which provides an output corresponding to the difference of the time-voltage product of appropriate combinations of the samples. This output after filtering represents the angle of incidence on the detectors with respect to a central axis. The triangular samples are also supplied to a demodulator whose output is an AGC voltage which is a function of the sum of the time-voltage integrals of the triangular samples. This AGC voltage is supplied to a pulse width modulator whose output controls the period of the voltage sample which is taken from each detector.

3,723,746

FIRE DETECTING APPARATUS SENSITIVE TO REFRACTION

Dennis Illingworth Lawson, and Eugene Francis O'Sullivan, both of Elstree, England, assignors to National Research Development Corporation, London, England

Filed Jan. 7, 1971, Ser. No. 104,675
Claims priority, application Great Britain, Jan. 7, 1970, 857/70; July 14, 1970, 34,218/70
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 R **12 Claims**



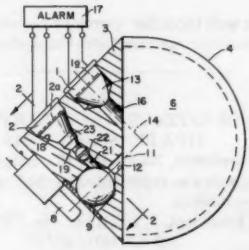
Fire detecting apparatus comprises an emitter for generating a beam of electromagnetic radiation and a detector for producing an output signal dependent upon the amount of radiation incident thereon. The apparatus is arranged to be responsive to a fluctuating component in the output of a detector to operate an alarm or fire control means.

3,723,747

PHOTOELECTRIC DETECTOR WITH COMPENSATING PHOTOCELL

Donald F. Steele, Cohasset, Mass., assignor to Electro Signal Lab. Inc., Weymouth, Mass.

Filed June 3, 1971, Ser. No. 149,637
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **11 Claims**



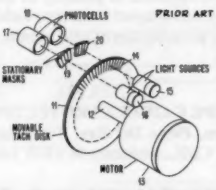
A smoke detector with a first cell sensing light scattered from matter to be detected and a second compensating cell has an adjustable plug for varying light from a source to the compensating cell and a diffuser for spreading the adjusted light over the same area of the compensating cell as the area of the first cell exposed to scattered light.

3,723,748

DIGITAL TACHOMETER WITH SYMMETRICAL OUTPUT

Ronald L. Coburn, and Oyvind Roth, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 23, 1971, Ser. No. 155,977
Int. Cl. G01d *5/36*
U.S. Cl. 250—233 **8 Claims**



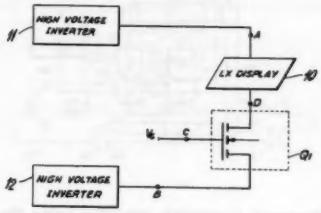
A two-phase optical tachometer whose two stationary masks and one movable mask are constructed to provide approximately a 3-to-1 dark-to-light ratio. The two masks, and two associated photocells, are oriented relative to the movable mask to provide two signals which are 90° out of phase. The electrical output signal of each photocell is cyclic in nature, and each cycle thereof provides an active triangular output waveform interval, corresponding to the presence of light, which is slightly larger than one-half of the total cycle time. Each of these electrical output signals is connected to the input of an amplifier whose sensitivity threshold is adjusted to a low value, and to a value which produces a cyclic square-wave output. Each square-wave cycle of the amplifier output is symmetrical; that is, each cycle includes an active output interval, corresponding to the presence of light, which is equal to one-half of the total cycle time. The frequency of the two signals provides distance and/or velocity information. The phase relationship of the two signals provides direction information.

3,723,749

DRIVING CIRCUIT FOR LIQUID CRYSTAL DISPLAYS

Robert C. Shapiro, Butler, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed April 14, 1972, Ser. No. 244,082
Int. Cl. G02f 1/28
U.S. Cl. 307—38 7 Claims



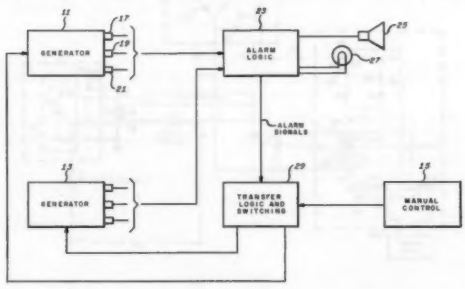
A driving circuit for liquid crystal displays is disclosed. The circuit comprises a single field effect transistor which operates in two different modes to drive the display. The field effect transistor (FET) is connected between a high voltage inverter and the display while a second high voltage inverter is also connected to the display. When input signals are fed to the FET, it acts as an inverter in one direction and as a source follower in the other direction driving the liquid crystal display with AC voltage.

3,723,750

MARINE ENGINEROOM MONITOR AND CONTROL SYSTEM

Harold G. Dixon, and Harold M. Ferrell, both of Charlottesville, Va., assignors to Sperry Rand Corporation, New York, N.Y.

Filed March 1, 1972, Ser. No. 230,821
Int. Cl. H02j 9/00
U.S. Cl. 307—64 8 Claims



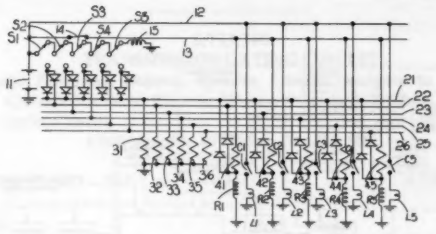
A monitor and control system for a ship's electrical power supply of the type having a standby generator. The system includes a variety of threshold detector sensing means responsive to various conditions relating to the operation of the generator. Upon the occurrence of a malfunction, the threshold detectors provide digital signals to an alarm logic circuit which actuates an audible alarm and enables a gating means so as to pass a pulse train to a lighting circuit and thereby provide a flashing visual alarm. The alarm logic circuit also contains acknowledge means operable by a member of the ship's crew. Operation of the acknowledge means switches a flip-flop so as to silence the audible alarm and maintain the visual alarm in a constantly illuminated condition. Correction of a malfunction returns the corresponding threshold detector to its normal condition, resets the alarm logic circuit and extinguishes the visual alarm. The system further contains an automatic transfer logic circuit which responds to the threshold detectors so as to remove the operating generator from the line when a malfunction occurs, determines if the standby generator is operative, and connects the standby generator across the line when its voltage and frequency have reached acceptable levels.

3,723,751

ELECTRICAL SYSTEMS FOR ROAD VEHICLES

William David Holt, Colne, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation of Ser. No. 873,410, Nov. 3, 1969, abandoned.
This application July 15, 1971, Ser. No. 163,052
Int. Cl. H02g 3/00
U.S. Cl. 307—10 R 2 Claims



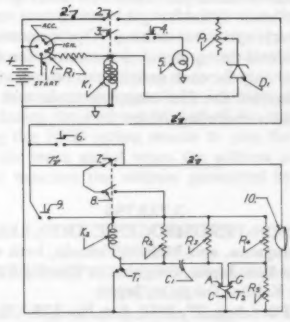
In an electrical supply system for a road vehicle, a plurality of electrical loads have associated therewith a plurality of switches. The system has a plurality of feed lines and each switch when operated causes a unique combination of at least two of the feed lines to be energized. This combination of feed lines serves in turn to operate means which causes power to be supplied from a supply line to the appropriate load.

3,723,752

COMBINATION TIME DELAY AND SELF-ACTUATING VOLTAGE LEVEL PROTECTIVE CIRCUIT FOR VEHICULAR ELECTRICAL SYSTEMS

Carl D. Russell, Tulsa, Okla., assignor to Harvey C. Overholt; Anna E. Overholt, Stillwater; W. L. Kygar; R. A. Parker and Evelyn B. Parker, Ponca City, all of Okla., part interest to each

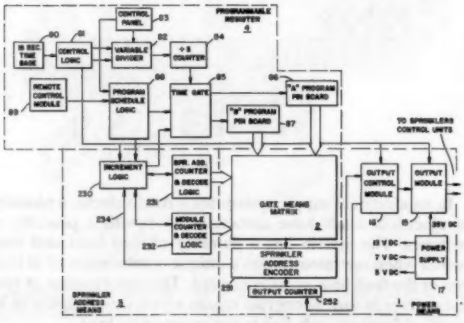
Filed Nov. 5, 1971, Ser. No. 196,027
Int. Cl. H02g 3/00
U.S. Cl. 307—10 BP 10 Claims



The invention resides in a modification of the vehicular electrical system to include a protected time delay circuit for maintaining the lights or the like ON for a predetermined period after initiation, and a voltage sampling interrupter for interrupting the electrical system when the battery voltage decays to a predetermined level if the lights or other load have been inadvertently left ON or short circuited, including the time delay circuit. One embodiment interrupts the power lead and accessory lead to protect the battery, whereas the other

embodiment provides a direct load path via the accessory contact of the ignition switch and an interruptible power bypass for a portion of the load path useful when the ignition is OFF. The circuit interrupts the power bypass lead to protect the battery.

3,723,753
PROGRAMMABLE IRRIGATION COMPUTER
Wayne Edward Davis, Bricktown, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed Dec. 8, 1971, Ser. No. 205,815
Int. Cl. H01h *43/00*
U.S. Cl. 307—41 **11 Claims**

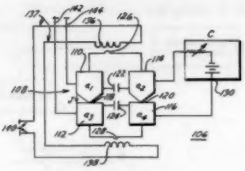


A programmable computer for operating sprinklers or other watering devices of an irrigation system in predetermined sequence which in a first mode, supplies a series of stepping pulses and interruptions for addressing each sprinkler of the system and, in a second mode, supplies sprinkler operating pulses of preselected duration to those sprinklers of the system that are to be operated when addressed. The stepping and operating pulses are established in a predetermined sequence by a programmer which includes a matrix of gate means, one corresponding to each sprinkler of the system, that enable the second mode by coincidence of at least two control signals. Sprinkler address means provides a first interrogation signal in sequence to each sprinkler gate means and enables both modes for each sprinkler address. A programmable register provides a second timing signal to the matrix for a preselected watering time only for each sprinkler to be operated. The timing signal disables the first stepping mode and enables the second sprinkler operating mode.

3,723,754
NON-THROMBOGENIC ARTICLES
Naohiro Murayama, and Makoto Fukuda, both of Iwaki-shi, Fukushima-ken, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed Aug. 27, 1971, Ser. No. 175,730
Claims priority, application Japan, Aug. 27, 1970, 45/75116
Int. Cl. G11c *19/00*
U.S. Cl. 307—88 ET **4 Claims**

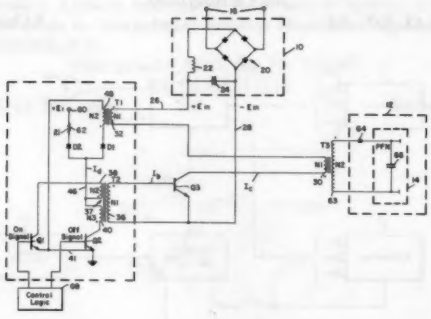
A non-thrombogenic article comprising: an electret having a stable heterocharge, prepared by decaying away the unstable heterocharge and homocharge of an electret, which is produced from a polymer in a conventional manner, said article being such that the negative-charge bearing surface of said electret forms the surface of the article to be brought into contact with the blood.

3,723,755
PARAMETRIC AMPLIFIER
Arthur L. Morse, 1420 Randall Court, Los Angeles, Calif.
Filed Oct. 12, 1970, Ser. No. 80,112
Int. Cl. H03k *3/38*
U.S. Cl. 307—88.3 **7 Claims**



A high frequency parametric amplifier using the quantum mechanical oscillation associated with transitions of electron pairs between two macroscopic quantum states, (Josephson tunneling) as the source of the idler or pumping frequency. An incoming signal causes the relative phase of two such cross coupled quantum amplifiers to change. This produces a change in the low frequency resistance of the device leading to relatively large output voltages.

3,723,756
HIGH EFFICIENCY CURRENT FEEDBACK CONTROL SYSTEM
Rodney J. Dahlinger, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Feb. 9, 1972, Ser. No. 225,004
Int. Cl. H03k *3/00*
U.S. Cl. 307—106 **10 Claims**



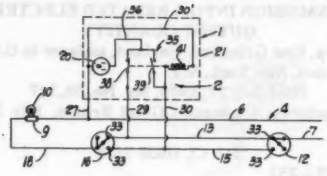
A high efficiency power switching system for charging loads by repetitively switching a power source to a load with the system reliably operating over relatively large load current variations. The switching system utilizes a proportion of the main switching transistor collector current to provide an efficient and rapidly responsive control of the base current to that transistor. The collector current is initially stepped down through a first transformer to a lower level to decrease the saturation loss of the switching transistor and of the controlling devices and is then stepped back up through a second transformer to the level required for efficient base drive up the main transistor. The controlling devices are periodically turned on and off and during the storage time of the main transistor a current proportional to the collector current is removed from the base of that transistor to reduce its storage time and decrease its turn off time. The system features provide an efficiently controlled main transistor and a highly efficient charging system.

3,723,757

ELECTRICAL CONVERTOR MEANS AND CIRCUIT

Stanley Bernath, 5136 Richmond Road, Bedford Heights, Ohio

Filed March 17, 1972, Ser. No. 235,754
Int. Cl. H01h 19/64
U.S. Cl. 307—114 14 Claims



A convertor for a three-way switching system by which a pair of leads therefrom can be maintained hot or live without regard to the "live" condition of the three-way system, the position of the respective three-way switches or which dummy line is otherwise hot.

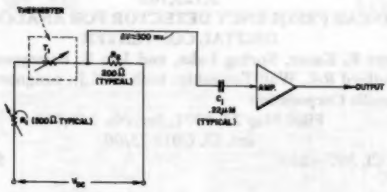
The convertor includes means ensuring that the output hot lead of the convertor is always interconnected with the dummy line in a three-way switching circuit, which is connected to the power source, so that the convertor output provides a complete circuit to and from the power source.

3,723,758

SOLID-STATE, NON-CONTACTING THERMISTOR ELECTRONIC SWITCH

Norman F. Sullivan, Anaheim, Calif., assignor to North American Rockwell Corporation

Filed April 5, 1972, Ser. No. 241,282
Int. Cl. H01h 35/00
U.S. Cl. 307—117 5 Claims



The switch includes a compressible plunger activated by depressing a key for permitting air to flow through a chamber housing a thermistor. The air flow changes the voltage drop across the thermistor for producing an output voltage signal representing the depressed key. A spring mechanism forces the key to return to its original position when released.

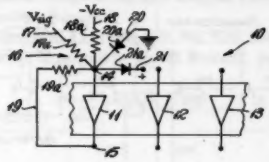
3,723,759

INTERFACE CIRCUIT

Irving J. Giguere, 383 Middle St., Bristol, Conn.

Filed April 26, 1971, Ser. No. 141,057
Int. Cl. H03k 19/12
U.S. Cl. 307—203 3 Claims

A circuit for rendering a binary source signal applied to the input of a TTL integrated circuit non-inverting gate to have the characteristics required by the gate for faultless operation as to voltage value and speed of change by a voltage dividing network and a feedback line from the output to the input of



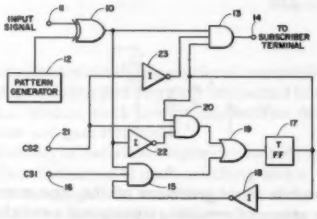
the gate. The gate input voltage is also clamped at high and low voltages.

3,723,760

TRANSMISSION GATING CIRCUIT

Jalal Ebrahimi, Ottawa, Ontario, Canada, assignor to Bell Canada-Northern Electric Research Limited, Ottawa, Ontario, Canada

Filed Nov. 29, 1971, Ser. No. 202,999
Int. Cl. H03k 17/00
U.S. Cl. 307—203 4 Claims



A transmission gating circuit for use in a digital multiplex system is disclosed. There is provided a comparator circuit comprising an exclusive-OR gate having a first input terminal connected to a source of serial binary input signal having an address portion and an information portion, a second input terminal connected to a pattern generator adapted to generate a signal which corresponds to a predetermined address, and an output terminal for obtaining a first output signal. An AND gating means is connected in series between the output terminal of the exclusive-OR gate and an output port for connection to a subscriber terminal. A gating circuit which includes a single memory unit is responsive to the first output signal and to first and second control signals for inhibiting the AND gating means during the address portion of the input signal and for allowing the AND gating means to pass the information portion of the input signal when the address portion of the input signal matches the address generated by the pattern generator.

3,723,761

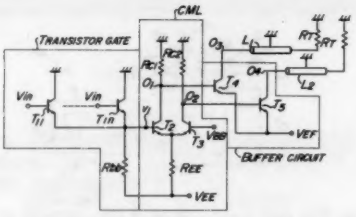
EMITTER-EMITTER COUPLED LOGIC CIRCUIT DEVICE

Akira Masaki, Sagamihara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 21, 1971, Ser. No. 182,419
Int. Cl. H03k 19/08
U.S. Cl. 307—208 6 Claims

An emitter-emitter coupled logic circuit (E^2CL) capable of driving a distributed constant circuit load with a low power at a high speed. the E^2CL comprises a conventional E^2CL and a buffer circuit consisting of a pair of transistors the emitters of which are connected in common to an emitter voltage source. The bases of the pair of transistors are connected to the output

terminals of the conventional E²CL. The loads are connected to the collectors of the transistors of the buffer circuit. Each of



the transistors may be provided with a saturation-proof diode connected between its base and collector.

3,723,762

SAW-TOOTH WAVE GENERATORS

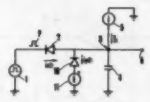
Naohisa Nakaya, Tokyo, Japan, assignor to Iwatsu Electric Company, Ltd., Tokyo, Japan

Filed July 30, 1971, Ser. No. 167,658

Claims priority, application Japan, July 28, 1970, 45/65557; July 28, 1970, 45/65558

Int. Cl. H03k *4/08*

U.S. Cl. 307—228 **8 Claims**



In a saw-tooth wave generator of the type comprising a capacitor, a source of switching signals and a switching diode connected between the capacitor and the source of switching signals so as to alternately charge and discharge the capacitor, there is provided a series circuit including a second diode having a polarity opposite to that of the switching diode with reference to the capacitor, the series circuit being connected in parallel with the capacitor whereby the storage current of the switching diode is substantially compensated for by the storage current of the second diode.

3,723,763

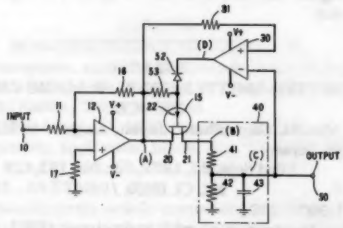
QUASI-RMS MEASUREMENT CIRCUIT UTILIZING FIELD EFFECT TRANSISTOR AS A SWITCH

Daniel John Udovic, Hazlet, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 2, 1971, Ser. No. 168,311

Int. Cl. H03k *17/00*

U.S. Cl. 307—229 **5 Claims**



The quasi-rms value of a signal is measured by employing a passive network which includes a first resistor connected in series with a parallel connection of a second resistor and a capacitor. A signal to be measured is selectively applied to the first resistor of the passive network via a field effect transistor (FET) which is operated as a switch. The FET is controlled by a comparator which, in turn, is responsive to the signal being measured and the desired quasi-rms signal.

3,723,764

ELECTRICAL CIRCUIT ARRANGEMENTS FOR CONVERTING A VARIABLE RATE OF PULSE TRANSMISSION INTO A RELATED ELECTRICAL OUTPUT QUANTITY

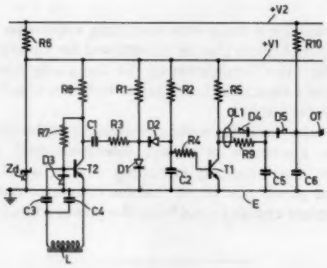
Denis Sharp, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,347

Claims priority, application Great Britain, July 25, 1969, 37,576/69

Int. Cl. H03k *9/06*

U.S. Cl. 307—233 **5 Claims**



An input circuit for use with a Frequency-to-DC converter circuit to provide the latter circuit with reset pulses of constant width irrespective of the input pulse frequency. The input circuit includes first and second time constant means, the first of which controls the setting of the second in response to each input pulse. The second provides, when set, a restoration period which defines the duration of a reset pulse to be applied to the Frequency-to-DC converter circuit.

3,723,765

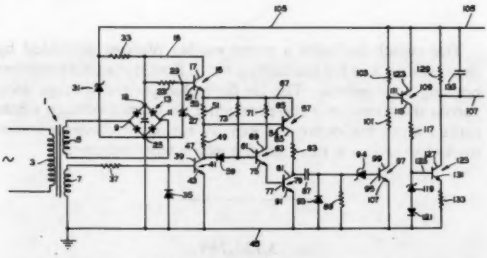
LINEAR FREQUENCY DETECTOR FOR ANALOG TO DIGITAL CONVERTER

Robert F. Kautz, Spring Lake, and Leo B. Bourgeault, New Bedford Rd., Wall Township, both of N.J., assignors to The Bendix Corporation

Filed May 25, 1971, Ser. No. 146,762

Int. Cl. G01r *25/00*

U.S. Cl. 307—233 **5 Claims**

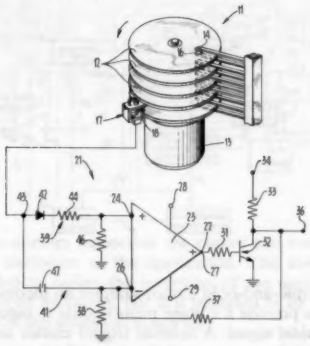


A device for converting an alternating current signal to a direct current voltage having an amplitude linearly proportional to the frequency of the signal in which the signal is converted to a square wave and the square wave is differentiated to provide pulses corresponding to the differential of the signal and the differentiated pulses are summed to provide the direct current voltage.

3,723,766
PEAK DETECTOR

Frank J. Sordello, San Jose, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Filed Aug. 16, 1971, Ser. No. 171,979
Int. Cl. H03k 5/20
U.S. Cl. 307—235 A 9 Claims

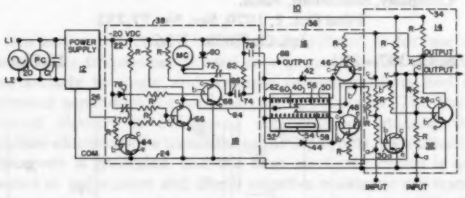


A circuit for detecting the peak of a pulse for purposes of reference, or the like. The circuit features a modified Schmidt trigger which is arranged to generate a square wave pulse having a leading edge coinciding with the peak of an incoming pulse from, for example, a once-around transducer associated with a magnetic disc memory.

3,723,767
REED RELAY TYPE PERMANENT NOR MEMORY CIRCUIT

Charles F. Meyer, Wauwatosa; Robert A. Wieczorek, Glendale, and Richard A. Waters, Milwaukee, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Sept. 27, 1971, Ser. No. 183,781
Int. Cl. G11c 11/34; H03k 3/26; H01h 47/00
U.S. Cl. 307—238 5 Claims

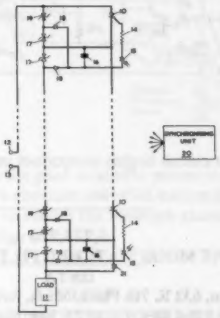


A circuit to be used with a transistorized logic memory which will cause the memory to be retentive when input power to the memory is interrupted and may be used in complex logic circuits, e.g., counters, shift registers, etc., which operate at high rates of speed. The retentive memory function is achieved by supplying inputs to the memory through a bistable state reed relay which causes the bistable state of the memory to correspond to the bistable state of the reed relay when power to the memory is initiated and supplying the outputs of the memory to the inputs of the reed relay which causes the bistable state of the reed relay to correspond to the bistable state of the memory when power to the memory is interrupted. The circuit is also arranged to prevent operation of the reed relay when the voltage of the direct current power source for the logic system is normal.

3,723,768
SEMI-CONDUCTOR DEVICES

Arnaud Michael Eccles, and Norman Leonard Potter, both of Stafford, England, assignors to The English Electric Company Limited, London, England

Filed Jan. 12, 1966, Ser. No. 520,206
Claims priority, application Great Britain, Jan. 21, 1965, 2,710/65
Int. Cl. H03k 17/60
U.S. Cl. 307—252 L 3 Claims



1. A controlled-rectifier trigger circuit comprising,
a plurality of controlled rectifiers connected in series across an a.c. source, each controlled rectifier having anode, cathode and gate electrodes,
a like plurality of radiation-responsive switching devices,
a capacitor connected to each switching device,
means connecting a said switching device and a corresponding one of said capacitors between the gate and cathode electrodes of each controlled rectifier,
a voltage dividing network connected across said source, said network comprising
a. a series chain of bi-directional or double-clipping zener diodes, three of said zener diodes being associated with each capacitor and two of them having the same operating parameters,
b. two like-poled uncontrolled rectifiers respectively connected in series with said two zener diodes, and
c. means connecting each said uncontrolled rectifier, together with its associated zener diode, in parallel with said capacitor, and
radiation-emitting means for periodically energizing all said radiation-responsive switching devices simultaneously with one another whereby to enable said rectifiers to be triggered by the d.c. voltages developed across their associated capacitors by the voltage dividing network.

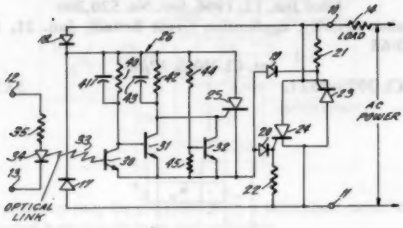
3,723,769
SOLID STATE RELAY CIRCUIT WITH OPTICAL ISOLATION AND ZERO-CROSS FIRING

Howard William Collins, Santa Ana, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 1, 1971, Ser. No. 194,738
Int. Cl. H03k 17/56
U.S. Cl. 307—252 UA 7 Claims

A solid state relay circuit is provided which has four terminals, two for power input, and two for signal input. The circuit consists of a full-wave diode bridge circuit having a pilot thyristor connected across its D.C. terminals. A firing control circuit also energized from these bridge terminals applies a firing signal to the thyristor gate responsive to the receipt of an input radiation signal from an optically isolated signal circuit connected to the signal input terminals, and causes the

delivery of a firing signal to a thyristor or triac when the input voltage is near or at zero. Thus, the thyristor or triac in the



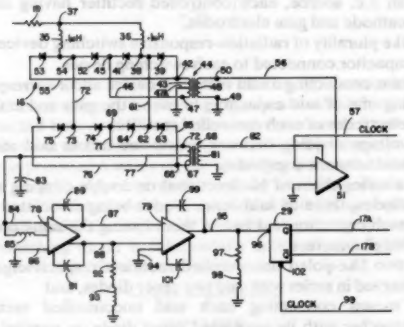
relay output circuit begins to conduct under zero voltage conditions.

3,723,770

CURRENT MODE MATCHED FILTER FOR DIGITAL DATA

Carl R. Ryan, 632 E. 7th Place, Mesa, Ariz.

Filed Oct. 14, 1971, Ser. No. 189,238
Int. Cl. H03k *17/74*
U.S. Cl. 307—256 **5 Claims**



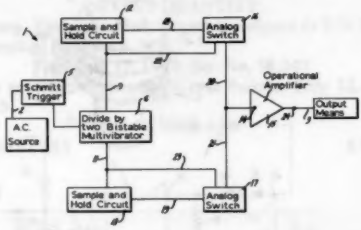
A matched filter for use in a bit-by-bit digital detection circuit is shown including a pair of inductors through one of which current including signal and noise flows during a particular bit period. At the end of that bit period the circuit is interrupted by a hot carrier diode and the resulting voltage pulse having a particular polarity and magnitude is passed through a second hot carrier diode which is turned on when the first hot carrier diode is turned off. The second hot carrier diode is immediately turned off after the pulse transient has been threshold detected. At the time of turning off the first hot carrier diode and the current charge therein dumped, signal current flows in the second inductor by the turning on of a hot carrier diode. At the end of the second bit period, the integrated current in the second inductor is interrupted by a further diode switch is momentarily turned on and then off. The polarity and magnitude of the second transient pulse is converted into the proper data pulse and while the current charge in this inductor is being dumped, the first inductor is again on and is receiving the current for the third pulse. That is, there is no need for a zero interval between data pulses because the current of one inductor is being processed and dumped while the other inductor is being charged with the new data current and so on.

3,723,771

FREQUENCY TO VOLTAGE CONVERTER

Michael B. McLean, Franksville, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Division of Ser. No. 88,849, Nov. 12, 1970. This application Feb. 28, 1972, Ser. No. 229,807
Int. Cl. H03k *5/00*
U.S. Cl. 307—261 **8 Claims**



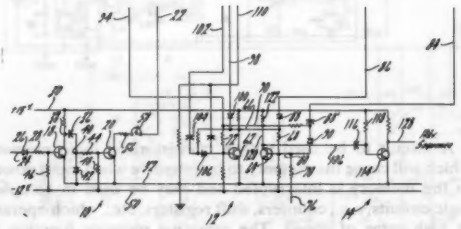
A sample-and-hold circuit samples an incoming alternating signal to provide a voltage proportional to input frequency of a sinusoidal signal. A Schmitt trigger circuit and a divide-by-two multivibrator convert the sinusoidal input signal into two square wave signals separated in phase by 180° and each corresponding to the previous full cycle of the input to provide sampling signals to a pair of sample-and-hold circuits. Each sample-and-hold circuit samples the opposite half cycle or period of a corresponding square wave. Transistor means are connected to the corresponding timing circuit to discharge a voltage storage means prior to sampling in response to the start of the sampling half period. Each sample-and-hold circuit includes a transistor selectively charging the voltage storage means from a constant voltage source during the sampling half period to produce a voltage level related to the input frequency which voltage level is held during the non-sampling half period. Analog switches are connected to the circuits and alternately connect each circuit to an output amplifier to apply the hold voltage during the non-sampling half period.

3,723,772

TENS AND UNITS TIMER FOR A WELDING SYSTEM

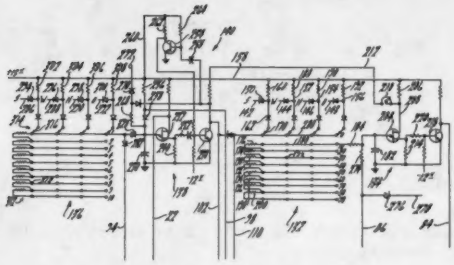
Cletus J. Collom, Birmingham, Mich., assignor to Weltronic Company, Southfield, Mich.

Filed Oct. 1, 1970, Ser. No. 77,232
Int. Cl. H03k *17/26*
U.S. Cl. 307—293 **15 Claims**



A timing system for use in conjunction with a welding system, wherein the timing system consisting of separate tens and units counters, the counters being electronically controlled to select the tens counter prior to the selection of the units counter. A system is provided for generating synchronizing pulses and a bistable circuit, in the form of a flip flop, is utilized to switch from the tens counter to the units counter upon completion of the tens count.

The purpose of the foregoing abstract is to enable the Patent Office and the public generally, and especially the scientists, engineers or practitioners in the art who are not familiar with patent or legal terms of phraseology to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, which is measured by claims, nor is it intended to be limiting as to the scope of the invention in any way.



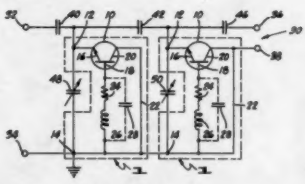
3,723,773
MULTIPLE RESONATOR ACTIVE FILTER

David K. Adams, Portola Valley, and Raymond Y. C. Ho, Sunnyvale, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Continuation-in-part of Ser. No. 821,317, May 2, 1969, abandoned. This application May 27, 1971, Ser. No. 147,407

Int. Cl. H03k *1/16*; **H03h** *7/02*, *11/00*

U.S. Cl. 307—295 **2 Claims**



An active inductance of essentially infinite Q for use at microwave frequencies is used as a general circuit element, particularly in single and multiple resonator filters and in channel separators for multiplexing applications. The basic circuit element is configured (constructed) utilizing the emitter electrode of a transistor as the input port, the collector electrode is grounded, and the base electrode circuit is adjusted so inductance and useful negative resistance are translated to the emitter from the base circuit at substantially the center of the desired frequency band of operation. The transistor current is adjusted so that the internal emitter resistance of the transistor essentially cancels the negative translated resistance to yield a synthesized microwave inductance with very high Q.

3,723,774
POWER SUPPLY WITH TEMPERATURE COMPENSATED CURRENT FOLDBACK

Donald H. Rogers, Ivyland, Pa., assignor to Jerrold Electronics Corporation, Philadelphia, Pa.

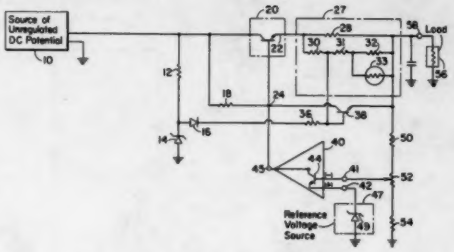
Filed Aug. 6, 1971, Ser. No. 169,686

Int. Cl. H03k *1/00*

U.S. Cl. 307—296 **2 Claims**

A power supply with overload current foldback employs series regulating feedback circuitry for normally controlling the base potential of a series pass transistor. A current limiting transistor selectively connects the pass transistor base and power supply output terminals for reducing pass transistor drive responsive to overload conditions.

A temperature responsive load current sensing network is employed to maintain the peak available power supply output current constant, and a constant potential source is utilized for the foldback circuitry to render the foldback characteristic independent of line voltage variations.



3,723,775
TWO TERMINAL NETWORK WITH NEGATIVE IMPEDANCE

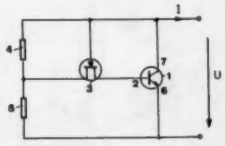
Alois Marek, Nussbaumen, Switzerland, assignor to Brown, Boveri & Company Limited, Baden, Switzerland

Filed March 8, 1971, Ser. No. 122,058

Claims priority, application Switzerland, March 23, 1970, 4329/70

Int. Cl. H03k *3/26*

U.S. Cl. 307—304 **8 Claims**



The present negative impedance two terminal network is embodied by two three terminal amplifiers, for example, one of which is a field effect transistor and the other is a bi-polar transistor, wherein the emitter-collector circuit of the bi-polar transistor and the source-drain circuit of the field effect transistor are connected in series with each other. The two terminals of the network are formed by the base and by the collector of the bi-polar transistor. Said collector is also connected to the gate terminal of the field effect transistor. A control voltage source is preferably connected between said base of the bi-polar transistor and the drain terminal of the field effect transistor, whereby said negative impedance is differentially adjustable by varying the control voltage.

3,723,776
TEMPERATURE COMPENSATED ZENER DIODE CIRCUIT

Raymond A. Schulz, Owego, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

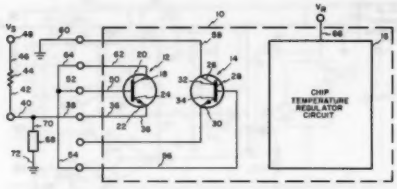
Filed Dec. 27, 1971, Ser. No. 212,268

Int. Cl. H03k *1/04*

U.S. Cl. 307—318 **7 Claims**

A temperature compensated zener diode circuit including a heating circuit and a pair of transistors mounted on a single monolithic integrated circuit chip with the heating circuit being electrically insulated from and thermally coupled to the

transistors, base junctions of said transistors being connected in series with one reverse biased to provide a zener effect and the other forward biased to provide thermal compensation whereby the combination of heating circuit and transistor



junction thermal compensation provide a zener diode circuit of improved stability and accuracy as well as adaptability to employment of present commercially available mono-lithic integrated circuits.

3,723,777

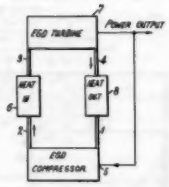
ELECTROGASDYNAMIC GENERATORS

Peter James Musgrove, Barley, England, assignor to National Research Corporation, London, England

Filed March 1, 1971, Ser. No. 119,804

Int. Cl. H02n 1/00

U.S. Cl. 310—5 **3 Claims**



An electrogasdynamic generator uses a gas containing small particles as the working fluid. The gas is circulated in a thermodynamic cycle round a closed loop and in an expansion stage the particles are electrically charged to expand against an electric field and in a compression stage are electrically charged to be compressed with the assistance of an electric field. The thermodynamic cycle used is the Ericsson cycle in which the gas is heated during its passage through the expansion stage and is cooled during its passage through the compression stage. A heat exchanger is incorporated between the two stages.

3,723,778

THICKNESS SENSOR FOR SPUTTERING SYSTEMS UTILIZING MAGNETIC DEFLECTION OF ELECTRONS FOR THERMAL PROTECTION

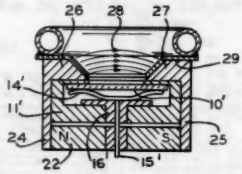
Chih-Shun Lu, Jamesville, N.Y., assignor to Inficon Inc., East Syracuse, N.Y.

Filed Feb. 7, 1972, Ser. No. 224,028

Int. Cl. H01v 7/00

U.S. Cl. 310—8.9 **7 Claims**

An improved sensor for monitoring the thickness of thin films deposited by sputtering. The sensor employs a conventional quartz crystal and heating of the crystal is prevented by providing a localized magnetic field which substantially eliminates electron bombardment of the exposed area of the crystal. The magnet that produces the field is provided with a



water cooled shield. The sensor can be used in either RF or DC sputtering systems.

3,723,779

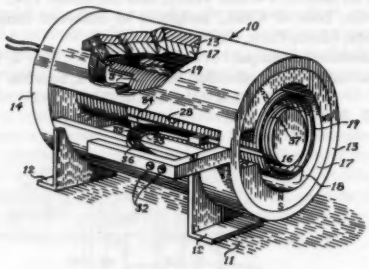
COMPENSATED LINEAR MOTOR

Donald E. Gillum, Goleta, Calif., assignor to Information Magnetics Corporation, Goleta, Calif.

Filed June 22, 1970, Ser. No. 47,977

Int. Cl. H02k 41/02

U.S. Cl. 310—13 **5 Claims**



A linear motor having a tubular shell and a center core of magnetic material, has a tubular working air gap formed between a magnet and the core or between the shell and the magnet. A tubular armature is disposed within the tubular air space. Compensation windings are provided that do not occupy the working air gap. Instead, these windings are placed in grooves in one surface of the working air gap and thereby do not increase the air gap dimension, nor decrease the flux density, resulting in an air gap of maximum flux density. With presently available magnets the grooves are preferably formed in the magnetic material of the shell or core. The compensation windings may be shorted, connected with the armature, as in parallel, or any combination.

3,723,780

SELF SHIELDING LINEAR MOTOR

Donald E. Gillum, Goleta, Calif., assignor to Information Magnetics Corporation, Goleta, Calif.

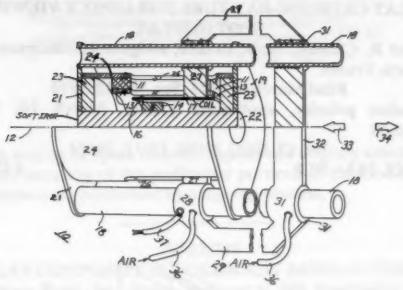
Continuation-in-part of Ser. No. 883,179, Dec. 8, 1969, abandoned, and a continuation-in-part of Ser. No. 47,977, June 23, 1970. This application July 6, 1971, Ser. No. 159,934

Int. Cl. H02k 41/02

U.S. Cl. 310—13 **23 Claims**

The invention provides a linear motor having tubular magnets that are radially polarized. An external shell of magnetic material conducts magnet flux through a low reluctance path to a center core inside the tubular magnet. A tubular armature coil, preferably helically wound, is placed over the center core

and occupies the air gap between the magnet and the low reluctance path. The motor can be closed at both ends or open



at one end, or both ends, and in any case there is a very low stray magnetic field.

3,723,781

ELECTROMOTOR

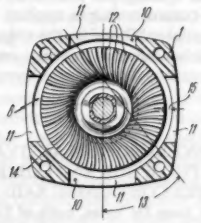
Albrecht Schnitzler, Jr., Nurtlingen/Wurttemberg, Germany, assignor to Metabowerke KG Closs, Rauch & Schnizler, Nurtingen/Wurttemberg, Germany

Filed Aug. 26, 1970, Ser. No. 67,151

Claims priority, application Germany, Aug. 27, 1969, P 19 43 478.7

Int. Cl. H02k *5/24*

U.S. Cl. 310—51 **5 Claims**



A stator is mounted in a housing of an electromotor, and a rotor is journalled for rotation in the housing relative to the stator. Impeller means rotates with the rotor and inherently tends to create audible sound frequencies in response to rotation in the ambient atmosphere. A requisite number of commuting or spoiler portions are provided on the impeller means such that upon rotation of the latter, substantially 15000 such spoiler portions pass per second any fixed point of the housing with reference to which the impeller turns. This commutes the audible sound frequencies to inaudible sound frequencies, that is sound frequencies which are normally inaudible to the human ear so that the electromotor is quieter to a listener.

ERRATA

For Classes 310—68 D thru 310—196 see:
Patents Nos. 3,723,794 through 3,723,797

3,723,782

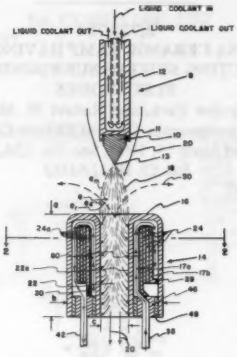
ARC LAMP WITH MAGNETIC VORTEX ANODE

Milton P. Rebne Thomsen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed Sept. 30, 1971, Ser. No. 185,008

Int. Cl. H01j *61/52, 1/50*

U.S. Cl. 313—30 **5 Claims**



An elongated hollow section cylindrical anode for use in a high pressure xenon short arc lamp. The cylindrical anode has an enlarged open axial passage extending therethrough. A strap of conductive material is wound within the hollow section to produce a high intensity magnetic field about the anode when the arc lamp is operating. The surface contour of the anode and the diameter of the axial passage therethrough are such that the high intensity magnetic field interacts with electrons in the arc column creating a vortical motion of the arc. The vortical motion of the arc disperses the footpoint of the arc along the anode walls of the axial passage, providing for greater heat dissipation and power handling capability.

3,723,783

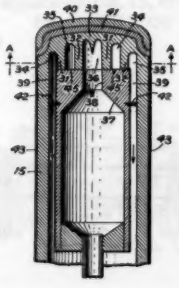
GASEOUS DISCHARGE HIGH INTENSITY LAMP WITH FLUID COOLED ELECTRODE

Norman C. Beese, Verona, N.J., and James J. Malloy, Jr., Easton, Pa., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed April 22, 1970, Ser. No. 30,716

Int. Cl. H01j *61/06, 61/52*

U.S. Cl. 313—32 **8 Claims**



A high intensity light source is provided by an arc discharge xenon lamp which includes an anode and a cathode electrode enclosed within a sealed, gas-filled, light transparent envelope. The electrodes are disposed in spaced relation such that an arc may be energized across the adjacent ends when a voltage is applied thereacross. The anode electrode is hollow and closed at the arc end. The internal surface at the hollow end has at

least one protrusion to increase the exposure surface and a fluid coolant provides greater heat dissipation therefrom. Preferably the anode electrode includes a tubular member of one metal having an enclosed end, a layer of tungsten capping the external arc end to form the arcing surface, and a further metallic layer joining the tubular member and the tungsten layer. In one embodiment, the metallic layer has a thermal expansion coefficient of an intermediate value between that of the tungsten layer and tubular member.

3,723,784

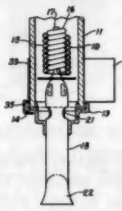
ALUMINA CERAMIC LAMP HAVING HEAT-REFLECTING SHIELDS SURROUNDING ITS ELECTRODES

Juris Sulcs, Fairview Park, and Robert W. McKimm, Euclid, both of Ohio, assignors to General Electric Company

Filed April 15, 1971, Ser. No. 134,207

Int. Cl. H01j *61/52*

U.S. Cl. 313—47 **6 Claims**



A high intensity sodium vapor lamp utilizing a tubular envelope of alumina ceramic closed at the ends by niobium end caps which support activated tungsten electrodes and which contains mercury and an excess of sodium not all of which is vaporized during operation. It is desirable that the excess of sodium and mercury condense in the exhaust tube or appendage and not about the interface between the end cap and the sealing glass binding it to the alumina envelope. This result is achieved by providing a heat shield of polished refractory metal about the ends of the arc tube next to the end caps.

3,723,785

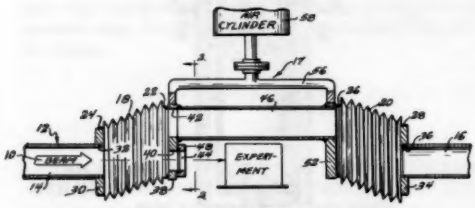
DEFORMABLE BEAM TRANSPORT SYSTEM WITH EXTRACTION PORT

Jack M. Nixon, Wheaton, and Warren J. Ramler, Elmhurst, both of Ill., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 23, 1972, Ser. No. 256,051

Int. Cl. H05h *9/00*

U.S. Cl. 313—63 **6 Claims**



A beam transport device for a particle beam traversing first and second sections of a beam tube includes a pair of bellows each having an end mounted to an associated one of the sections of the beam tube. Interposed of the bellows and sealed to associated ends thereof are a particle-beam-extraction window and a rigid hollow member juxtaposed of the extraction window. Motive means are coupled to provide motion to the extraction window and rigid hollow member whereby they may be respectively aligned with the particle beam upon deformation of the bellows.

3,723,786

FLAT CATHODE-RAY TUBE FOR DIRECT VIEWING SPOT DISPLAY

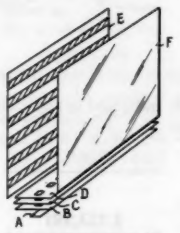
Daniel R. Charles, Paris, France, assignor to Thomson-CSF, Paris, France

Filed March 4, 1971, Ser. No. 121,076

Claims priority, application France, March 10, 1970, 7008540

Int. Cl. H01j *29/50, 31/12, 29/74*

U.S. Cl. 313—70 R **4 Claims**



The present invention relates to a cathode-ray tube designed for point display. them;F cathodoluminescent

The tube comprises an electron-gun embodying a series of cathodes 2 arranged on a conductive band A, an electrode C for the individual control of each of said cathodes in said series, and two additional parallel electrodes running along the band A over the whole of its length, one of then,F carrying a cathodoluminsecent coating and the other, E,metal strips 11. By combining the control voltages applied to C, on the one hand, and the potential exhibited by the strips 11 in relation to that of the cathodoluminescent coating, on the other hand, spot display on the cathodoluminescent layer is achieved.

3,723,787

RED LUMINESCENT EUROPIUM ACTIVATED YTTRIUM OXYCHLORIDE PHOSPHOR AND COLOR TELEVISION DISPLAY TUBES CONTAINING SAID PHOSPHOR

George Blasse, and Jaap De Vries, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 654,652, July 19, 1967, abandoned. This application March 6, 1970, Ser. No. 17,013

Int. Cl. C09k *1/08;* **H01j** *29/20*

U.S. Cl. 313—92 PH **3 Claims**

Europium activated red luminescing phosphor for color television, said phosphor being a trivalent europium activated oxychloride of an element such as a rare earth metal such as yttrium, lanthanum and gadolinium.

3,723,788

SPARK CHAMBER APPARATUS FOR DETECTING RADIATIONS

Eizo Goto, Chigasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

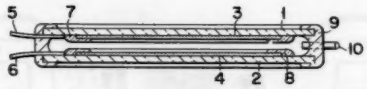
Filed Sept. 15, 1970, Ser. No. 72,435

Int. Cl. H01j *39/26*

U.S. Cl. 313—93 **6 Claims**

A spark chamber apparatus for detecting radiations which essentially comprises a directly sealed spark chamber enclosing an electric sparking gas at normal pressure and thin elec-

trode layers covered over the boundary zone thereof with non-electroconductive glaze.



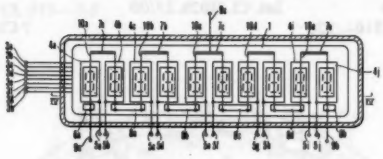
The sealing of spark chamber by the use of glazy substance and the covering of the perimetric portions of electrodes are simultaneously performed by a dipping process.

3,723,789

FLAT COMPOSITE FLUORESCENT DISPLAY TUBE

Mikiharu Tanji, Ise, Japan, assignor to ISE Electronics Corporation, Ise City, Japan

Filed Dec. 8, 1970, Ser. No. 96,025
Claims priority, application Japan, Dec. 13, 1969, 44/99882
Int. Cl. H01j *1/72, 1/88, 63/00*
U.S. Cl. 313—108 R **6 Claims**



In a composite fluorescent display tube of the type comprising an insulator substrate, a plurality of display members mounted on one surface of the substrate, each of the display members including a plurality of fluorescent segments which are selectively energized to display a selected letter, a filament confronting these plurality of display members, and a evacuated envelope containing the above described component parts, there are provided a plurality of independent electrode structures, one for each one of the display members, each electrode structure including a letter forming electrode having a plurality of perforations corresponding to the fluorescent segments, a mesh control grid electrode and a frame shaped electrode interposed between the letter forming electrode and the control grid electrode for connecting them into a unitary structure; and conductors common to corresponding ones of the fluorescent segments of the display members, said conductors extending along the opposite surface of the substrate.

3,723,790

ELECTRICAL LAMP OR TUBE COMPRISING COPPER COATED NICKEL-IRON ALLOY ELECTRICAL CURRENT CONDUCTORS AND A GLASS ENCLOSURE

William H. Dumbaugh, Jr., and Joseph W. Malmendier, both of Painted Post, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,524
Int. Cl. H01j *17/16;* **C03c** *3/04*
U.S. Cl. 313—221 **5 Claims**

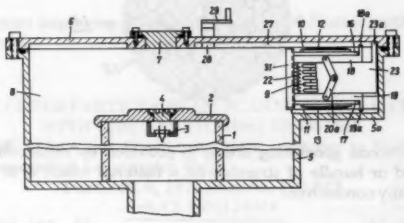
Electrical articles, including electrical lamps and tubes, have dumet electrical current conductors and a glass enclosure sealed to the conductors. The glass enclosure may be composed entirely of a $Na_2O—Li_2O—K_2O—BaO—Al_2O_3—SiO_2$ electrical sealing glass, or may be composed of a soda-lime glass envelope joined to the conductors with an intermediate component of the sealing glass.

3,723,791

ELECTRICAL HIGH VOLTAGE APPARATUS EQUIPPED WITH A MOVABLE AIR LOCK DEVICE FOR EXCHANGING THE FILAMENT OF AN ELECTRON GUN

Franz Stocklein, 1 Berlin, Germany, assignor to Max-Planck Gesellschaft Zur Forderung der Wissenschaften e. V., Gottingen, Germany

Filed Feb. 9, 1972, Ser. No. 224,789
Claims priority, application Germany, Feb. 26, 1971, P 21 10 130.4
Int. Cl. H01j *1/00, 1/92*
U.S. Cl. 313—237 **14 Claims**



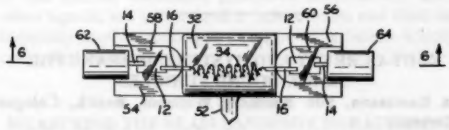
An electric high-voltage apparatus such as an electron accelerator or the like includes a tank having a wall and a tank access located in the wall for making the interior of the tank accessible. An electrical discharge vessel is disposed in the tank and contains replaceable parts. The vessel has a wall and is insulatingly spaced from the tank wall. A vessel access is located in the vessel wall for making the replaceable parts accessible. A tube-like air lock device having a longitudinal axis is movable in the tank transversely to this axis from a given rest position to an operative position located between the tank access and said vessel access. The device includes expansion structure for defining a gas-tight passage between the vessel access and the tank access when the device is in the operative position thereof.

3,723,792

ELECTRIC INCANDESCENT LAMPS HAVING REFRACTORY METAL PHOSPHATE AND PHOSPHIDE COATINGS FOR REFRACTORY METAL LEADS

Vincent Chiola, 329 York Avenue; James S. Smith, R.D. No. 2, and Clarence D. Vanderpool, R.D. No. 2, all of Towanda, Pa.

Division of Ser. No. 3,937, Jan. 19, 1970, which is a continuation-in-part of Ser. No. 647,106, June 19, 1967, abandoned. This application Jan. 13, 1972, Ser. No. 217,594
Int. Cl. H01j *5/50*
U.S. Cl. 313—318 **11 Claims**



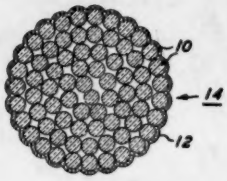
Lamps operating at high temperatures, and more particularly incandescent or arc lamps having sealed-in lead-in electrical conductors with improved service characteristics and longer service life are fabricated with a "coating"on the aforesaid leads comprising at least one of the following: a phosphate or phosphide of tungsten, or a phosphate or phosphide of molybdenum.

3,723,793

COATED CORONA GENERATING ELECTRODE

Richard J. Komp, Bowling Green, Ky., and John W. Weigl, West Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Division of Ser. No. 612,124, Jan. 27, 1967, Pat. No. 3,566,108. This application Oct. 8, 1970, Ser. No. 79,230
Int. Cl. H01j 1/53
U.S. Cl. 313—355 7 Claims



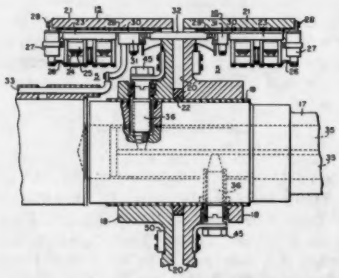
A corona generating article is provided by overcoating a strand or bundle of strands with a material which is at least partially conductive.

3,723,794

RECTIFIER ASSEMBLY FOR BRUSHLESS EXCITATION SYSTEMS

Andrew J. Spisak, Bethel Park, and Louis E. Nagoda, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed March 6, 1972, Ser. No. 232,084
Int. Cl. H02k 11/00
U.S. Cl. 310—68 D 4 Claims



A rectifier assembly for brushless excitation systems in which rectifier diodes are mounted on support wheels on a shaft, and in which the wheels form part of the rectifier circuit and are connected to axial output leads in a shaft bore by radial connecting members extending through the hub of each wheel and through the shaft to the axial leads.

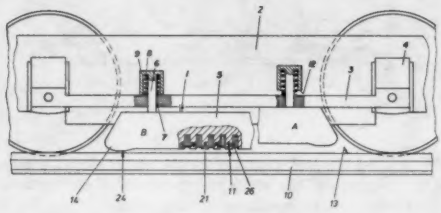
3,723,795

EDDY-CURRENT AND HYSTERESIS BRAKE FOR TRACK-BOUND VEHICLES

Max Baermann, 506 Bensberg Wulfshof, Bezirk, Cologne, Germany

Filed July 12, 1971, Ser. No. 161,609
Int. Cl. H02k 49/00
U.S. Cl. 310—93 12 Claims

A novel eddy-current and hysteresis brake for track-bound vehicles is provided which incorporates resisting skids or rollers to eliminate wear problems associated with prior art brakes of this type. The particular magnetic construction of the pole surface is critical to obtain maximum hysteresis and eddy-current forces with a uniform air gap and the minimum energization. The pole surface is also formed to prevent undesirable air currents or the accumulation of dirt or other disturbing external build-up, while providing maximum pole surface and winding relationships. An alternating pole configuration is provided along the direction of movement of the vehicle.

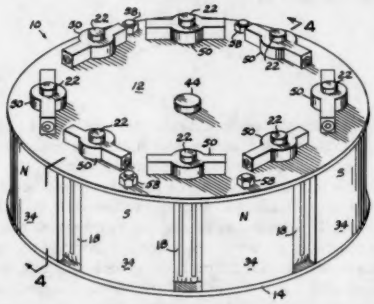


3,723,796

MULTI-ARMATURE MOTOR

Elmer B. Mason, 901 Vickie Drive, Del City, Okla.

Continuation-in-part of Ser. No. 35,685, May 8, 1970, Pat. No. 3,651,355. This application March 20, 1972, Ser. No. 236,114
Int. Cl. H02k 23/00
U.S. Cl. 310—126 7 Claims



A plurality of armatures are supported in parallel spaced relation in a circular array between interdigitated magnetic pole pieces energized by a central coil.

3,723,797

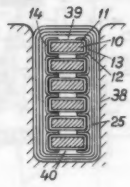
INSULATED COIL FOR ARRANGEMENT IN A SLOT IN THE STATOR OR ROTOR OF AN ELECTRICAL MACHINE

Anders R. Andersson, and Anders Bjorklund, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 22, 1970, Ser. No. 82,953
Claims priority, application Sweden, June 5, 1970, 7803/70; June 5, 1970, 7804/70
Int. Cl. H02k 1/00
U.S. Cl. 310—196 15 Claims

A coil positioned in the slot of a stator or rotor in an electric machine is formed of a bundle of conductors arranged close together and insulated from each other and from the slot. The conductor insulation consists of a layer of enamel and a tape of corona resistant insulating material running longitudinally of the conductor is adhered to the enamel layer. The tape surrounds the parts of the conductor facing the main insulation

which surrounds the bundle of conductors and furthermore overlies at least those parts of the sides of the conductor which



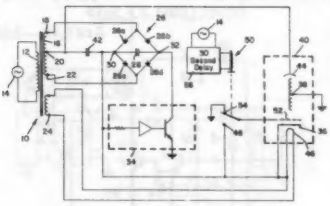
face the adjacent conductors which parts are situated nearest the sides facing the main insulation.

3,723,798

TRAVELING WAVE TUBE POWER SUPPLY

Lawrence H. O'Brien, Fountain Valley, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 1, 1972, Ser. No. 248,903
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 **4 Claims**



A traveling-wave tube power supply utilizes a single high voltage power transformer. A full-wave bridge rectifier arrangement is connected to the high voltage secondary winding which together with a filtering capacitor provides the requisite potential between the TWT cathode and the slow wave structure. A "depressed" cathode/collector potential is obtained across one output side of the bridge rectifier and a center tap of the high voltage secondary. This arrangement provides a high voltage, low current cathode/slow wave structure potential, and a lower voltage (by approximately 50 percent) high current cathode/collector potential.

In a preferred embodiment, the filament power supply may share the same transformer primary winding as the high voltage power supply since the filament and cathode are connected to thetube's modulation anode during tube warm-up.

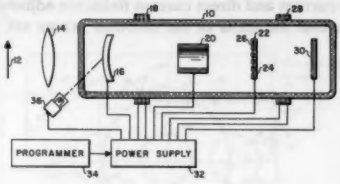
3,723,799

IMAGE CORRELATOR WITH IMAGE SHIFT DETECTION CAPABILITY

Klaus J. Hecker, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Aug. 28, 1964, Ser. No. 394,380
Int. Cl. H01j *31/48*
U.S. Cl. 315—11 **3 Claims**

This invention relates to an electro-optical system capable of determining the transtational shift of one image of a given scene with respect to another image obtained a short time before. This is accomplished by measurement of the amount of



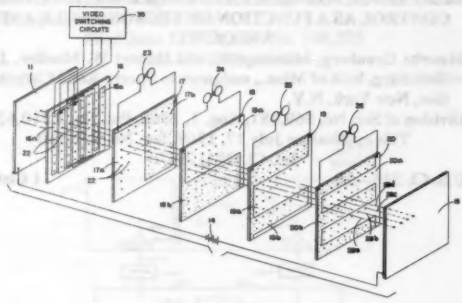
electrons impinging on phosphor screen **30** from a particular direction.

3,723,800

CHARGED PARTICLE BEAM SCANNING APPARATUS WITH VIDEO SWITCHING NETWORK

Farrell A. McCann, Hawthorne, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Feb. 8, 1971, Ser. No. 113,567
Int. Cl. H01j *29/41*
U.S. Cl. 315—12 **11 Claims**



Sequentially appearing video signals as may be generated by means of a single scanning beam are processed for display in a plurality of simultaneously appearing beams of a charged particle beam scanner. Video signals corresponding to each of the scanning beams are successively fed to corresponding hold circuits, the number of such hold circuits corresponding to the number of scanning beams. The scanner has a plurality of beam channels defined between an area charged particle source and target with control plate means simultaneously controlling the scanning of each of the beams in these channels. A modulator control plate also is included for simultaneously controlling the intensity of each of the beams. Video signals are simultaneously fed from the hold circuits to corresponding beam control electrodes of the modulator control plate to provide simultaneous modulation of all of the beams. In this manner successive groups of consecutively arriving video signals, are memorized in hold circuits and then simultaneously used to modulate corresponding beams which are controlled to scan the target.

3,723,801

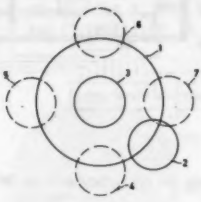
MEASURING THE BEAM LANDING CHARACTERISTIC OF A SHADOW-MASK CATHODE-RAY TUBE

John Kenneth Oxenham, Blackburn, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 16, 1970, Ser. No. 55,441
Claims priority, application Great Britain, Aug. 5, 1969, 39,156/69
Int. Cl. H01j *29/54*
U.S. Cl. 315—13 C **11 Claims**

A method of adjusting the electron beam landing in a color display tube on the screen of which phosphor dots are pro-

vided which are impinged upon by the electron beams so that they luminesce with different colors. One electron beam is activated while the picture to be displayed is a white raster. Alternating current and direct current fields are adjusted in such a manner that the spots of the electron beams are arranged



symmetrically relative to the phosphor dots, which may be found with the aid of a detector arrangement, for example, a photomultiplier which is exclusively sensitive to the color corresponding to the active electron beam. The landing characteristic may be measured and the color purity may be adjusted.

3,723,802

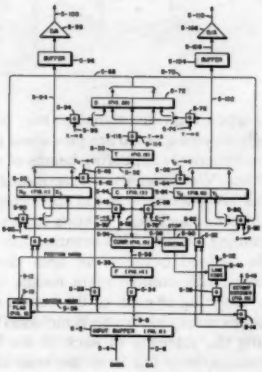
DIGITAL VECTOR GENERATOR UTILIZING INTENSITY CONTROL AS A FUNCTION OF VECTOR ANGLE AND VELOCITY

Mauritz Granberg, Minneapolis, and Hubert W. Mueller, Jr., Hamburg, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 569,481, Aug. 1, 1966, Pat. No. 3,510,634. This application July 17, 1969, Ser. No. 871,160

Int. Cl. H01j *29/70*

U.S. Cl. 315—18 **1 Claim**



An intensity control circuit for use in a high-precision vector generator in which the intensity of the trace on a cathode ray tube is controlled as a function of the angle and speed at which a vector is to be drawn.

3,723,803

GENERATION, DISPLAY AND ANIMATION OF TWO-DIMENSIONAL FIGURES

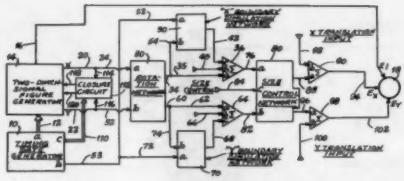
Lee Harrison, III, Englewood; Frank David Wells, and Francis J. Honey, both of Denver, all of Colo., assignors to Computer Image Corporation, Denver, Colo.

Filed July 6, 1970, Ser. No. 52,389

Int. Cl. H01j *29/70*

U.S. Cl. 315—22 **23 Claims**

A system for automatically generating, displaying and animating two-dimensional figures comprising straight line segments, animations of the figures including gross size, gross position, shape and rotational animation sequences. Means are also provided for maintaining the figure closed through



any animation sequence and establishing boundary conditions for the figure.

3,723,804

VERTICAL DEFLECTION DEVICE UTILIZING RECTIFYING MEANS FOR DEFLECTION CONTROL

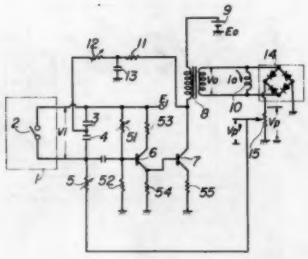
Noboru Yasumatsuya, Kadoma-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 7, 1970, Ser. No. 95,677

Claims priority, application Japan, Dec. 12, 1969, 44/100399

Int. Cl. H01j *29/70*

U.S. Cl. 315—276 D **6 Claims**



A vertical deflection device which comprises deflection-signal generating means for producing deflection signals to be applied to a cathode-ray tube, rectifying means to rectify the deflection signals, and controlling means to control the deflection-signal generating means by the rectified voltages of the deflection signals, whereby an operation for correcting the deflection signal to a substantially S-shaped signal in order to prevent tangent distortions from appearing for the reason that a projecting screen of the cathode-ray tube is not spherical, may be easily effected.

3,723,805

DISTORTION CORRECTION SYSTEM

Theodore J. Scarpino, and Douglas W. Holbrook, both of Endwell, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

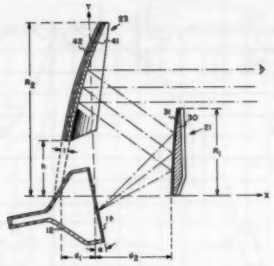
Filed May 12, 1971, Ser. No. 142,706

Int. Cl. H01j *29/80*

U.S. Cl. 315—27 GD **4 Claims**

Combinational distortion correction in a cathode ray tube (CRT) head-up display is accomplished for both optical distortion and CRT distortion by electronically predistorting the displays that appear on the face of the CRT. The corrections are performed in one step by the implementation of a complete mathematical model describing the combinational distortion patterns. The corrections to the vertical and horizontal CRT deflection voltages are represented as com-

binations of a plurality of transformation functions which are electronically mechanized by a straight line segment approximation technique where the slope and segment lengths are controlled by diode segment generators.

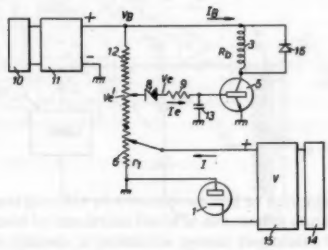


3,723,806

ADJUSTABLE STABLE POWER SUPPLY FOR CONTINUOUS WAVE MAGNETRON

Maurice Francois Poussereau, Conflans Saint Honorine, and Marcel Denis, Paris, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed March 30, 1972, Ser. No. 239,529
Claims priority, application France, April 7, 1971, 7112281
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.51 **6 Claims**



A power supply circuit for a continuous wave magnetron provides adjustable stable power levels. A first direct voltage source is connected across the magnetron and a second direct voltage source from a common alternating voltage source is connected across the magnetron coil in series with a direct current amplifier. Current feedback to the input of the amplifier is derived from the magnetron by an adjustable voltage divider connection to the first voltage source. Another portion of the voltage divider provides a third direct voltage connection between the second source and amplifier input, the amplifier input current being the sum of current from the third source and adjustable current from the magnetron.

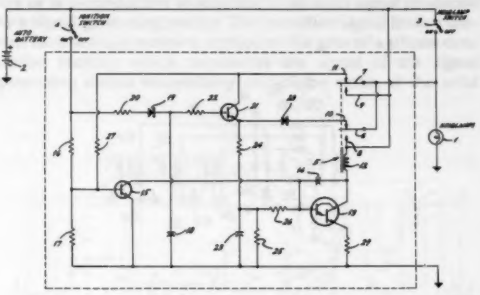
3,723,807

AUTOMOTIVE HEADLAMP DELAYED OFF DEVICE

Joseph Tozzi, Lafayette Hills, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 26, 1971, Ser. No. 202,436
Int. Cl. B60q *1/04*
U.S. Cl. 315—83 **5 Claims**

A delayed-off headlamp circuit in which the delay feature is invoked only within a predetermined time interval after the ignition is turned off. Otherwise headlamp operation is normal. This permits the user to invoke a delay when he desires it but is not bothered by an undesired delay otherwise.

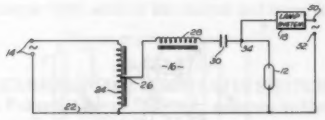


3,723,808

LIGHTING SYSTEM UTILIZING HIGH INTENSITY DISCHARGE LAMPS

Bill F. Jones, Los Angeles, Calif., assignor to Smoot-Holman Company, Inglewood, Calif.

Filed June 1, 1971, Ser. No. 148,375
Int. Cl. H05b *39/00*
U.S. Cl. 315—95 **10 Claims**



A lighting system is disclosed in which high intensity discharge lamps (e.g. mercury vapor lamps) are operated in combination with other lamps (e.g. incandescent lamps) to afford consistent and improved lighting. Somewhat-conventional ballast circuits are disclosed for energizing a high intensity discharge lamp in any of three states including warm-up, illumination and recovery. Another lamp is then included in the system, to be energized under the control of the potential developed across the high intensity discharge lamp, referenced to a base potential that is somewhat intermediate to the extreme levels developed across the discharge lamp during its various phases of operation, as provided by the ballast circuit. Embodiments with both autotransformer and dual winding transformer ballast circuits are disclosed, along with various sources of the intermediate base potential.

3,723,809

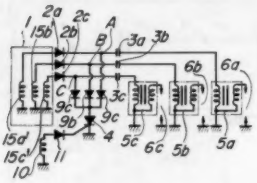
MAGNETO-DYNAMO-OPERATED IGNITION DEVICE FOR MULTI-CYLINDER ENGINES

Minoru Fujii, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan

Filed March 30, 1971, Ser. No. 129,342
Claims priority, application Japan, April 4, 1970, 45/32714
Int. Cl. H05b *37/02*; F02p *1/00*
U.S. Cl. 315—211 **7 Claims**

A magneto-dynamic-operated ignition device for a multi-cylinder engine comprising a magneto dynamo, a plurality of discharge capacitors and a plurality of ignition coils; said magneto dynamo having a 2-pole rotor, an even-pole stator and an armature coil wound on every other pole of said stator poles, the number of which is determined depending on the number of cylinders; said discharge capacitors and ignition coils being

equal in number to or half as many as the cylinders. Discharging circuits of the discharge capacitors are interrupted by a common rectifier which is controlled by ignition timing signals from ignition timing magneto dynamos.



3,723,810

ELECTRONIC FLASH DEVICE

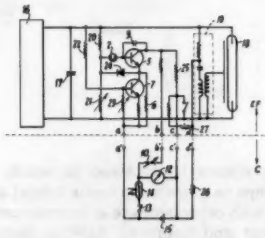
Yukio Mashimo, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1971, Ser. No. 206,071

Claims priority, application Japan, Dec. 8, 1970, 45/108769; April 15, 1971, 46/29205

Int. Cl. H05b *41/40*

U.S. Cl. 315—241 P **9 Claims**



An electronic flash device comprising a circuit having a first semi-conductor which functions switching action in correspondence to the charging condition of a main capacitor storing flash energy, a load connected to an emitter of said semi-conductor, and a second semi-conductor which varies output resistance in correspondence to the charging condition of said main capacitor and is connected in parallel with said load, said circuit being provided between the main capacitor and an exposure meter circuit of a camera.

3,723,811

DISSIPATION OF STATIC ELECTRICITY

Frans P. Koeleveld; Reginald Mak Ngo, both of Newport News, and Russell G. Duby, Williamsburg, all of Va., assignors to Dow Badische Company, Williamsburg, Va.

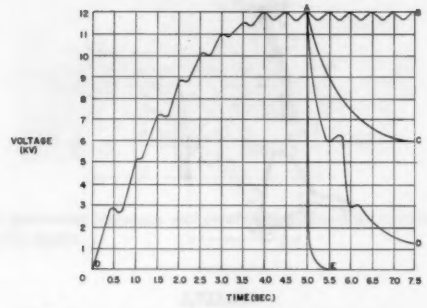
Filed Feb. 9, 1971, Ser. No. 113,865

Int. Cl. H05f *3/00*

U.S. Cl. 317—2 R **1 Claim**

Disclosed is a method of imparting static dissipation efficacy to flooring otherwise incapable of dissipating static electricity to any practical extent.

The flooring is covered at one or more chosen positions with a fabric, conveniently in the form of a "throw rug" or other similar structure, which fabric contains yarns comprising electrically conductive material. An efficient dissipation of high concentrations of static electricity accumulated by humans is effected by a simple stepping or walking upon the throw rug.



3,723,812

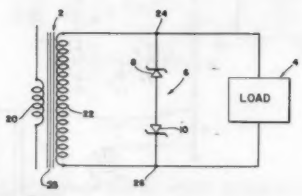
AUXILIARY MEANS FOR COMPLETING CURRENT TRANSFORMER SECONDARY WINDING CIRCUIT

John C. Lynch, Canonsburg, Pa., assignor to McGraw-Edison Company, Elgin, Ill.

Filed March 18, 1971, Ser. No. 125,486

Int. Cl. H02h *7/04*

U.S. Cl. 317—14 A **8 Claims**



A semi-conductor switch means is provided which is connected to a current transformer secondary winding and is responsive in conduction to the voltage across the secondary winding rising to a predetermined level upon the removal of the load on the secondary winding and its open circuiting. The secondary winding itself is part of the circuit and the impedance of the winding limits the current flow through the switch means.

3,723,813

ALARM CIRCUIT FOR MONITORING THE PRIMARY WINDING OF A NEUTRALIZING TRANSFORMER AND ITS GROUNDING CONNECTION

Gordon Y. R. Allen, 4 Ireland Court, Islington, Ontario, Canada

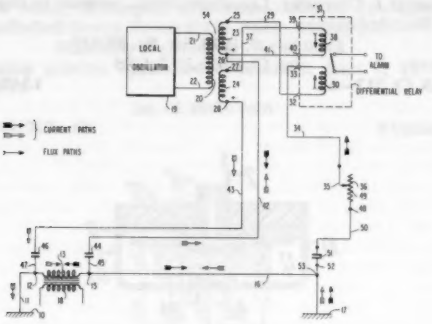
Filed Jan. 17, 1972, Ser. No. 218,108

Int. Cl. H02h *3/28*

U.S. Cl. 317—18 B **6 Claims**

A remote alarm and indicating circuit for the primary of a neutralizing transformer utilizing an oscillator to produce balanced opposing signals in the primary and grounding circuits. These signals also flow through the coils of a differential

relay in such a manner that if the ground circuit opens or if there is an appreciable change in its impedance or resistance,



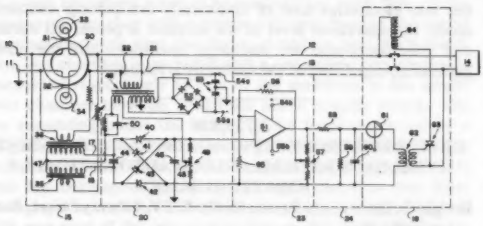
on the order of 5 percent or more, the differential relay will operate denoting such an occurrence.

3,723,814

PHASE-SENSITIVE GROUND FAULT PROTECTIVE SYSTEMS

Thomas A. O. Gross, Concord Road RFD, Lincoln, Mass.

Filed May 1, 1972, Ser. No. 249,156
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **12 Claims**



To prevent possible electrocutions and to minimize the risk of fires caused by insulation faults in alternating current power distribution systems, a protective system responsive to ground fault currents in phase with the line potentials interrupts the electrical power. Ground fault currents are detected by a sensor responsive to differential or unbalanced currents in the supply conductors of the distribution system. The unbalanced currents are compared with the phase of the line potentials by a demodulator to detect only in-phase components and produce an output signal representing a true fault, the magnitude of which depends on the degree of current imbalance. Output signals exceeding a threshold value trip a circuit breaker to remove power from the load conductors. The combination is sensitive to ground faults of either high or low resistances, and is substantially insensitive to spurious signals which do not represent true faults.

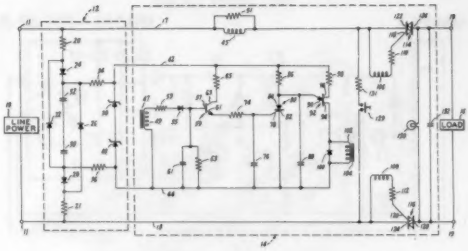
3,723,815

ELECTRONIC CIRCUIT PROTECTIVE DEVICE

E. Curtis Ambler, Newington; Andrew E. Scoville, Ellington, and Walter R. Bush, West Simsbury, all of Conn., assignors to The Stanley Works, New Britain, Conn.

Continuation-in-part of Ser. No. 101,748, Dec. 28, 1970, Pat. No. 3,668,471. This application June 5, 1972, Ser. No. 259,765
Int. Cl. H02h *3/28*
U.S. Cl. 317—18 D **20 Claims**

A protective circuit device for connection between an associated electrical power supply and an associated electrical load which detects faults in the current drawn by the load. A solid state switch in the protective device is rendered conductive or non-conductive in response to an input signal produced by a signal generating means. The amplified signal from a current fault sensing means is applied to the gate of a silicon controlled rectifier which terminates the signal of the signal generating means maintaining one of the states of the solid



state switch to open the circuit controlled thereby.

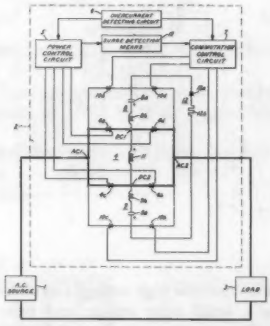
In the several embodiments, the protection device detects excessive current drawn by the load, or electrical leakage from the load by means of a differential transformer which produces an error signal when there is current imbalance between conductors from the line supply, or both. The preferred solid state switch is a triac, and desirably solid state switches couple both sides of the output and input terminals.

3,723,816

CURRENT LIMITING STATIC SWITCH

Ernest M. Pollard, Cherry Hill, N.J., assignor to General Electric Company

Filed Jan. 21, 1972, Ser. No. 219,621
Int. Cl. H02h *3/08*
U.S. Cl. 317—20 **9 Claims**



Disclosed is a bidirectional current limiting static circuit breaker including four power thyristors arranged to form two conducting paths. Each path includes two of the thyristors and a common current limiting inductor. Commutation means are provided to render any fault current carrying power thyristors non-conductive upon command. The current limiting inductor acts to insure that commutation proceeds to a successful conclusion once begun. The breaker also includes means for suppressing commutation induced transients and for protecting nonconducting power thyristors from externally originated voltage surges.

3,723,817

VEHICLE BATTERY CHARGING SYSTEMS

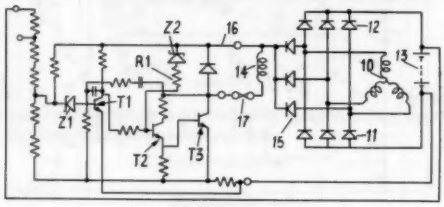
Gordon Harris Leonard, Chalfont, St. Peters, Bucks; Zycmunt Sobecki, North Greenford, Middlesex, and Peter Robert Lomas, London, all of England, assignors to C. A. V. Limited, Birmingham, England

Filed Sept. 1, 1971, Ser. No. 177,014

Claims priority, application Great Britain, Sept. 4, 1970, 42,428/70

Int. Cl. H02h *3/20*

U.S. Cl. 317—31 4 Claims



A vehicle battery charging system includes an alternator having an exciting winding and a voltage regulator which includes a transistor connected in series with the exciting winding to control the current flow therein. In the event of a voltage surge a Zener diode breaks down and causes the transistor to conduct thereby placing the transistor in a better state to withstand the voltage surge.

3,723,818

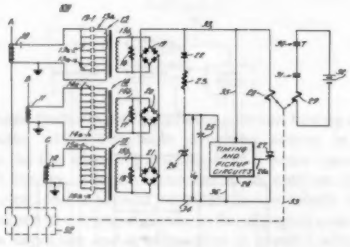
DIRECT ACTING OVERCURRENT SYSTEM FOR HIGH VOLTAGE CIRCUIT BREAKERS

Stanley E. Zocholl, Holland, Pa., assignor to I-T-E Imperical Corporation, Philadelphia, Pa.

Filed Oct. 5, 1971, Ser. No. 186,672

Int. Cl. H01h *47/18*

U.S. Cl. 317—36 TD 3 Claims



A solid state system for high voltage circuit breaker applications utilizing a solid state sensor and time delay circuit adapted to simulate din induction disk type time-current characteristics utilizing standardized components otherwise employed in low voltage breaker applications with adjustable features for tailoring the trip current generated by the solid state circuitry to be compatible with the particular magnetic latch being employed in the high voltage circuit breaker. The magnetic latch is provided with an independent isolated winding controlled by an isolated power source for performing a tripping operation under the control of external and remote control means. Isolation of the sensor and timing circuitry from the control transformers prevents disruptive or damaging transients from being coupled to the solid state sensing circuitry.

3,723,819

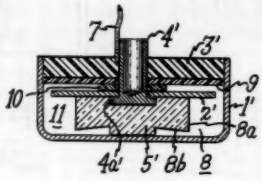
LOW VOLTAGE SECONDARY LIGHTNING ARRESTER SPARKGAP ASSEMBLY

Francis J. Charewicz, Lanesboro, Mass., assignor to General Electric Company

Filed Nov. 9, 1970, Ser. No. 87,929

Int. Cl. H02h *3/22, 9/06*

U.S. Cl. 317—61 13 Claims



A sparkgap assembly for a low voltage lightning arrester is formed by mounting a disc-shaped electrode in spaced-apart relation with a cup-shaped electrode with a block of insulating material between the two electrodes. The block of insulating material serves as a preionizer to ionize the sparkgap between the electrodes when a surge voltage is applied to the arrester. The block of material is also characterized by incorporating baffle means that operate to prevent arc-generated contaminants, such as particles of electrode metal, from being deposited on preselected, shielded portions of it. By thus maintaining portions of the resistance path disposed between the two electrodes free of electrically conducting contaminants, the sparkover level of the arrester is preserved during and after successive arc discharge operations and the noise generating capability of the assembly is reduced.

3,723,820

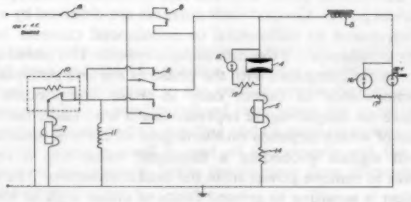
DEVICE FOR PROTECTING AGAINST A.C. TRANSIENT OVERLOADS WITH MEANS FOR AUTOMATICALLY RESETTING SAME

Dwight L. Brown, c/o Brown Radio & TV, Liberty Street, Barbourville, Ky.

Filed Jan. 3, 1972, Ser. No. 215,060

Int. Cl. H02h *3/22*

U.S. Cl. 317—16 8 Claims



An arrangement for protecting transistorized equipment from transient A.C. overloads including a circuit having a Siemens tube, or other non-polarized gas filled tube, therein to fire and shunt the overload to ground. Also included is a current delay device or choke to allow the shunting circuitry to become actuated before the transient can reach the protected load. The circuitry includes a time delay-thermal relay to momentarily break the A.C. input to the protected load and to the Siemens tube causing it to discontinue arcing so that it may reset. A counting device may also be included for recording the number of times the Siemens tube fires.

3,723,821
QUENCH-GAP ASSEMBLY FOR LIGHTNING ARRESTERS

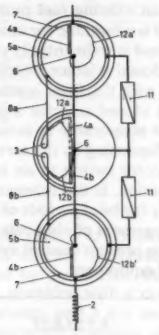
Eugen Meier, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed May 19, 1972, Ser. No. 254,962

Claims priority, application Switzerland, June 7, 1971, 8304/71

Int. Cl. H02h 9/06

U.S. Cl. 317—69 **4 Claims**



A quench-gap assembly of a lightning arrester includes a cylindrical spark-over chamber and a pair of cylindrical spark blow-out chambers located respectively to each side of the spark-over chamber and connected thereto by slits. A central electrode extends into the three chambers and each spark blow-out chamber is provided with a concentric ring electrode connected respectively to one of the members in the spark-over chamber between which the arc is initially struck. The arc expanding under the action of the force produced by a magnetic field reaches the central electrode in the form of two partial arcs each which is then directed through one of the slits into the corresponding spark blow-out chamber and there further given a combined rotational and expanding movement with one root of the arc terminating on the central electrode and the other root on the ring electrode.

3,723,822
CIRCUIT BOARD PANEL FRAME CONSTRUCTION

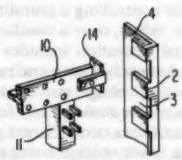
Takashi Kosugi; Hiroyuki Abe, and Hisao Sudo, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Sept. 20, 1971, Ser. No. 181,902

Claims priority, application Japan, Sept. 21, 1970, 45/83127

Int. Cl. H02b 1/02

U.S. Cl. 317—101 DH **1 Claim**



A frame assembly for mounting a plurality of plug-in circuit board panels includes a frame with a top and base member having engagement edges. Front and rear supporting bars are held in position by the engagement edges at any desired point in the frame, thereby permitting expansion of the panels in accordance with demand. Guide plates having grooves and central cooling apertures support the panels, and in turn, are supported by the front and rear supporting bars.

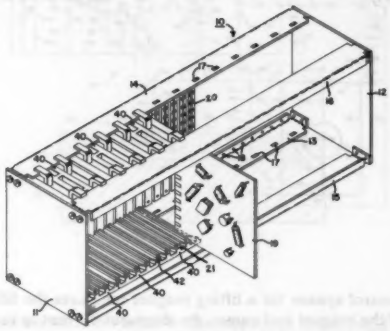
3,723,823
PRINTED CIRCUIT BOARD GUIDE

Harry B. Lit, Peabody, Mass., and Mark S. Mazzetti, Los Gatos, Calif., assignors to General Electric Company, Lynn, Mass.

Filed Nov. 30, 1971, Ser. No. 203,224

Int. Cl. H02b 1/02

U.S. Cl. 317—101 DH **6 Claims**



A board guide for providing alignment of a printed circuit board with the connector during and after insertion into the connector. The board guide comprises a base having track channels therein slightly wider than the thickness of a printed circuit board. Extending from the base are a pair of L-shaped restraining members and a pair of L-shaped latching members. Each L-shaped latching member terminates in a beveled tooth which cooperates with part of the base and which engages a slotted frame under of a chassis thereby securing the guide device to the chassis. The L-shaped restraining members also cooperate with the base to resist any force applied to the guide device in a direction perpendicular to the plane of the base which might tend to effect the removal of the guide device or otherwise damage the latching members.

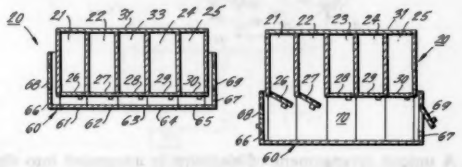
3,723,824
TELESCOPING OUTDOOR SWITCHBOARD AND AISLE SECTIONS

John Cuorato, Springfield, and Charles V. Stull, Ambler, both of Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Dec. 13, 1971, Ser. No. 207,428

Int. Cl. H02b 1/06

U.S. Cl. 317—120 **8 Claims**



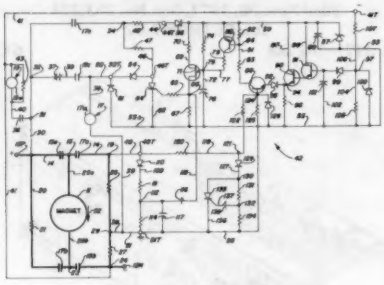
The aisle section of outdoor walk-in type switchgear is telescoped over the front of the switchboard during shipment and is telescoped outwardly and is assembled with an aisle floor when delivered to its site of installation. Lifting and shipping members are provided as integral parts of the telescoping assembly.

3,723,825

MAGNET CONTROLLER

Terrence E. De Viney, Seven Hills, Ohio, assignor to Square D Company, Park Ridge, Ill.

Filed Jan. 19, 1972, Ser. No. 219,020
Int. Cl. H01f *13/00*
U.S. Cl. 317—123 **12 Claims**



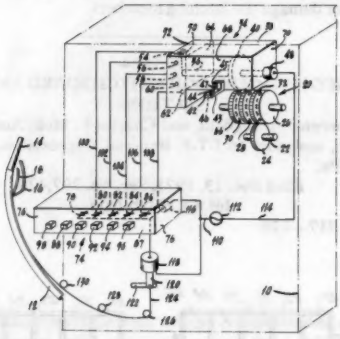
A control system for a lifting magnet measures the lift current of the magnet and causes the drop-out current to reach a predetermined percentage of the lift current at interruption so that clean drops are provided, without adjustment, regardless of the condition of the circuit elements, the temperature of the lifting magnet, or the size of the magnet.

3,723,826

CONTROL APPARATUS FOR FUEL PUMPS

Edward Kelly, 227 Norway Avenue, Trenton, N.J.

Filed Sept. 30, 1970, Ser. No. 76,817
Int. Cl. B67d *5/30*
U.S. Cl. 317—135 R **15 Claims**



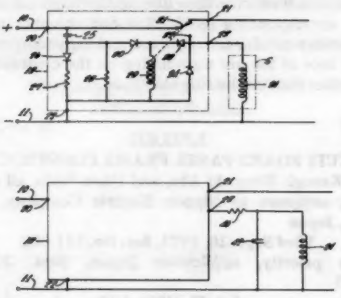
A unique arrangement of elements is integrated into discrete modules for automatically controlling the quantity of fuel dispensed from service station fuel pumps in response to a pre-selected value. The arrangement may include three principal assemblies consisting of two modules and a solenoid. A rotary switching arrangement may be housed within the first module to be directly mechanically driven by a cost-of-purchase totalizer of the service station fuel pump. The rotary switch includes arcuately arranged, fixed electrical contact buttons which are each electrically connected with one of a plurality of selector switches provided within the second module. A keyboard having a plurality of pushbuttons may be displayed on a face of a second module and each pushbutton is operable to close a corresponding one of the selector switches. The first and second modules may be electrically connected to form a normally opened series circuit, having a plurality of branch circuits. A solenoid may be integrated with the second module and connected in parallel with the circuit for resetting each pushbutton upon the dispensing of the desired dollar amount of fuel. A second solenoid may be connected in parallel with the circuit to be operable, upon actuation, to apply a mechanical pull to an existing fuel pump cutoff mechanism. The electrical circuit is adaptable for connection with a source of electrical power and is momentarily closed by the co-existing conditions of a closed selector switch and the engagement of the rotary switch with the fixed contact button electrically connected with that closed selector switch. The momentary closing of the circuit is operable to actuate both solenoids to cut off further fuel dispensing by the service station fuel pump and to reset the selector switch to an initial position for the next dispensing operation. In this manner of operation, the circuit is energized only for brief periods of time for actuating the solenoids. The arrangement of elements is such as to facilitate the installation of the present control system either in existing pumps or as original equipment.

3,723,827

SELECTIVE AND SEQUENTIAL CONTROL SYSTEM

David E. Griswold, Corona Del Mar, and William E. McCarty, Orange, both of Calif., assignors to Griswold Controls, Santa Ana, Calif.

Filed Feb. 11, 1972, Ser. No. 225,460
Int. Cl. H01h *47/14*
U.S. Cl. 317—137 **23 Claims**

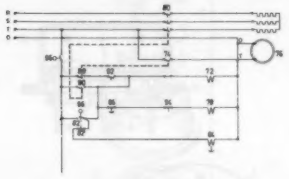


A known system for controlling a plurality of stations, such as irrigating sprinkler valves, over a conductor pair for either selective or sequential activation includes a solenoid as the device to be activated at each station and requires short interruptions in the operating voltage at a control point to effect sequential activation of the stations, but for selective activation this same system utilizes two different voltage levels with short interruptions, a lower voltage being required to bypass unwanted stations and higher voltage built up at a controlled rate being required for selective activation of a station. An improvement in the known system includes delay means in association with the solenoids at the stations for delaying the response of the solenoids thereby simplifying the equipment the control point by permitting the use of only one voltage level, while avoiding activation of unselected stations.

3,723,828
COUPLING MEANS FOR ELECTRIC INCINERATOR LAVATORIES

Sven Olof Edholm, Villavagen 27, Vadstena, Sweden

Filed July 23, 1971, Ser. No. 165,036
Int. Cl. H01h 47/18
U.S. Cl. 317—141 R 8 Claims

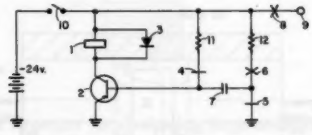


The present invention relates to coupling means for an incinerator chamber in electric incinerator lavatories, said chamber being heated by an electric element. Said means comprise a first relay, provided with a coil, between the terminals of a current source and a fan motor, and a second relay, with a coil, between the terminals of the current source and the electric element. The invention is chiefly characterized by a parallel circuit containing, in one branch, a closed contact in a repeating time relay in series with the coil of the second relay, and in the other branch, one switch which is in series with the coil of the time relay and is coupled between the terminals of the current source in series with a second switch which is mechanically coupled to the first switch, said second switch breaking when the first switch closes, and vice versa.

3,723,829
REPETITIVE PULSE GENERATING CIRCUIT

Knut Roger Schartmann, Montreal, Quebec, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Aug. 16, 1971, Ser. No. 171,976
Int. Cl. H01h 47/32
U.S. Cl. 317—141 S 9 Claims

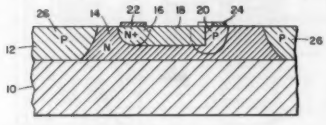


A pulse generator for reversing a d.c. supply at 10 cycles per second for a telephone control circuit uses a relay operated by a transistor either directly or by means of an additional transistor. A timing capacitor is connected to the base of the transistor and the other terminal of the capacitor is switched to ground by the relay after the transistor turns off, and is switched to a charging resistor connected to the power supply after the transistor turns on. When the capacitor is grounded, other contacts of the relay provide a charging path from the power supply through a resistor to the ungrounded side of the capacitor. The first-mentioned charging resistor may be connected to the power supply through R-C filtering. When an additional transistor is used which is of the complementary type relative to the timing transistor, the circuit's tolerance of power supply ripple can be improved by the addition of feedback through a diode.

3,723,830
LOW CURRENT, NOW NOISE AVALANCHE DIODE

Thomas M. Frederiksen, Scottsdale, and Ernest L. Long, Tempe, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Oct. 14, 1970, Ser. No. 80,619
Int. Cl. H01l 9/00
U.S. Cl. 317—234 R 8 Claims

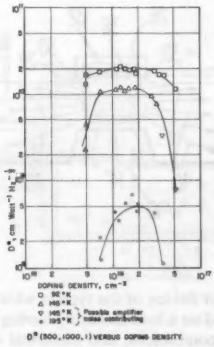


A low current, low noise avalanche diode is disclosed which can be provided on a semiconductor chip, in which a region of highly doped material of one conductivity type is produced in an epitaxial layer of material which is less highly doped and is of the same conductivity type, and at least one finger of such highly doped material extends from said highly doped region towards and makes a PN junction with a region of oppositely doped material. Contacts are applied to the two regions and act as the electrodes of the resultant diode.

3,723,831
INDIUM ANTIMONIDE INFRARED RAY DETECTOR

Cedric G. Rogers, Cincinnati, Ohio, assignor to Arco Corporation, Cincinnati, Ohio

Filed Dec. 4, 1970, Ser. No. 95,164
Int. Cl. H01l 15/00
U.S. Cl. 317—234 R 3 Claims



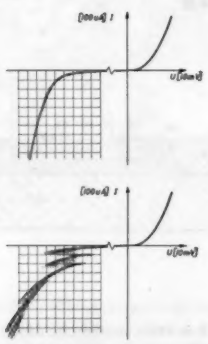
The invention is an indium antimonide infrared ray detector which is operable efficiently (i.e., with a maximum black body detectivity) over a wide range of temperatures and at much higher temperatures than heretofore attainable.

3,723,832

ZENER DIODE AND METHOD OF PRODUCING SUCH A ZENER DIODE

Alfred Bachmeier, 8265 Simbach, Germany, assignor to Licentia, Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 27, 1971, Ser. No. 147,537
Claims priority, application Germany, June 1, 1970, P 20 26 683.5; June 1, 1970, P 70 20 323.5
Int. Cl. H01l 9/00
U.S. Cl. 317—234 R 3 Claims



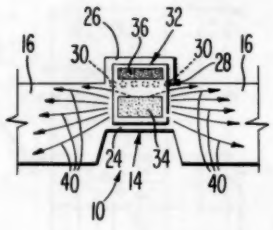
A Zener diode having a semiconductor body with recombination centers therein in the region of the P-N junction. The invention also includes a method of producing such a diode.

3,723,833

HEAT SINKING OF SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation

Filed July 19, 1971, Ser. No. 163,570
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 10 Claims



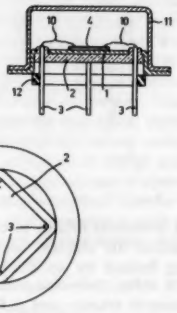
A semiconductor device of the type in which a semiconductor chip is mounted on a lead assembly having a chip mounting portion, thermal conductors, and electrical conductors. The chip has some elements which generate heat, which are located in one zone of the chip, and others which are sensitive to spatial thermal gradients, which are located in a different zone of the chip. The chip mounting portion of the lead assembly has an area substantially free of spatial thermal gradients and the zone of the chip containing the sensitive elements is mounted adjacent to this area.

3,723,834

SEMICONDUCTOR DEVICE HAVING A CLOSED CONDUCTIVE RUBBER RING CLAMPED AROUND ALL ELECTRIC CONDUCTORS

Geradus Johannes Anthonius Peters, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 779,474, Nov. 27, 1968, abandoned.
This application July 27, 1971, Ser. No. 166,611
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 3 Claims



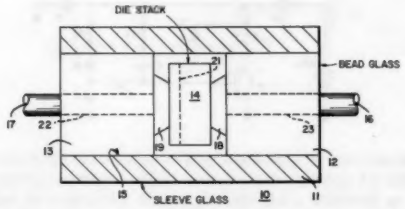
A semi-conductor device including a housing for a semiconductor body of the field-effect type having an insulating gate electrodes and electric conductors which emerge from the housing and are located in a circle. The conductors are surrounded by a closed, flexible ring of an electrically conductive rubber material such as electrically conductive silicon rubber, e.g., a rubber mixed with electrically conductive particles. This ring is so flexible that it contacts all of the conductors without substantially bending them.

3,723,835

GLASSES FOR ENCAPSULATING SEMICONDUCTOR DEVICES

Earl K. Davis, Tempe, and Kent W. Hansen, Scottsdale, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 28, 1971, Ser. No. 166,931
Int. Cl. H01l 3/00
U.S. Cl. 317—234 R 9 Claims

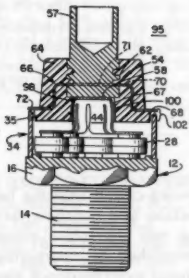


Alkali-free glasses for encapsulating semiconductor devices, such as zener diodes, wherein preformed (pressing and sintering) glass packages are formed are disclosed. To prevent degradation of the zener diodes, seals compatible with Dumet lead wire are achieved at temperatures below 550°C. The packages consist of a sleeve glass surrounding glass beads which are sealed to the beads and to the sleeve. Preferably the sleeve glass is slightly harder (higher viscosity at a given temperature) than the bead glass.

3,723,836
HIGH POWER SEMICONDUCTOR DEVICE INCLUDED IN A STANDARD OUTLINE HOUSING

Hart Shekerjian, Scottsdale, and Stanley R. Oulman, Phoenix, both of Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed March 15, 1972, Ser. No. 234,766
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 13 Claims

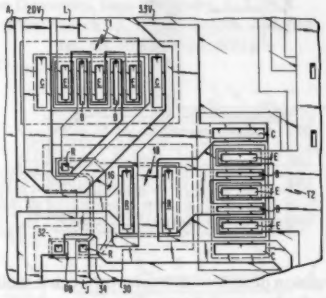


The device structure for dissipating large amounts of heat includes a plurality of paralleled semiconductor units having first terminals connected together by a first contact and second terminals connected together by a flexible member which is connected to a second contact. Housing members, one of which has an insulating portion, tend to mechanically hold the contacts in a spaced relation while electrically isolating them. The flexible member has a flat surface which abuts against the second contact and a plurality of flexible leg portions which each make electrical connection to one of the semiconductor units. The housing members and the flexible member cooperate to limit the magnitudes of forces applied to the semiconductor devices during fabrication. The flexible member is compressed by the completed housing to assure that electrical contact is sustained between the semiconductor units and the contacts even though parts of the device thermally expand during operation.

3,723,837
RESISTOR BED STRUCTURE FOR MONOLITHIC MEMORY

Paul H. Bardell, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1970, Ser. No. 74,439
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 10 Claims

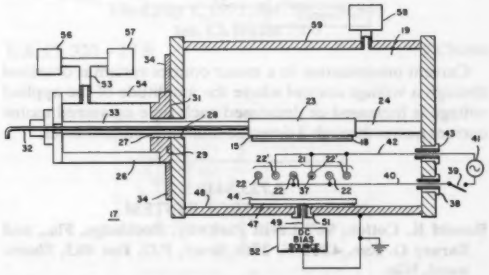


A monolithic integrated semiconductor memory structure having both an array of bistable cells and supporting circuits for the array formed in the same semiconductor structure is bilevel powered to reduce the heat dissipation problem. Resistors used in the supporting circuits are located in common resistor beds with a means for making electrical contact, such as a diode, to the resistor bed and to provide bias during the low power standby time to the bed. The means also isolates the bias voltage supply from the bed when the signal to the resistor is increased to the high power level.

3,723,838
NITROGEN-DOPED BETA TANTALUM CAPACITOR

Henry Yasuo Kumagai, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,876
Int. Cl. H01g 1/01
U.S. Cl. 317—258 4 Claims



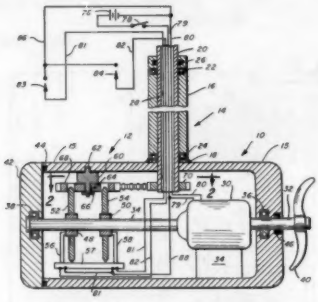
A nitrogen-doped beta tantalum thin-film capacitor is disclosed. The thin-film capacitor comprises a thin-film electrode supported on a non-conductive substrate. Covering a selected area of the thin-film electrode is a dielectric film comprising an oxidation product of nitrogen-doped beta tantalum. Opposing the thin-film electrode and separated therefrom by the dielectric film is a counter electrode.

3,723,839

TROLLING MOTOR WITH STEERING MEANS

Howard A. Cramer, Tulsa, Okla., assignor to Lowrance Electronics Mfg. Corp., Tulsa, Okla.

Filed March 27, 1972, Ser. No. 238,327
Int. Cl. H02k *7/10*
U.S. Cl. 318—15 **3 Claims**



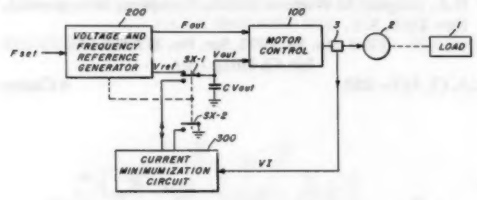
This invention describes an improved electric trolling motor system for driving small boats. The motor which drives the propeller also drives a gear train through electrical clutches. Gears are designed to separately cooperate with a third gear means to rotate the trolling motor with respect to a support rod fastened to the boat. By connecting one or the other clutch to a battery, the direction of the motor can be rotated to the right or to the left.

3,723,840

APPARATUS FOR MOTOR CURRENT MINIMIZATION

Kenneth E. Opal, Oakmont; Charles R. Kelly, Murrysville, and Charles W. Newcamp, Lower Burrell, all of Pa., assignors to Power Control Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1972, Ser. No. 219,703
Int. Cl. H02p *5/28*
U.S. Cl. 318—432 **8 Claims**



Current minimization in a motor control system is obtained through a voltage control where the amplitude of the applied voltage is increased or decreased each time measured motor current passes through a detected minimum current level.

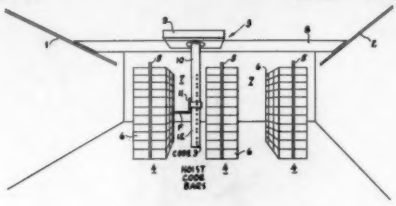
3,723,841

MOTOR CONTROL SYSTEM

Ronald K. Cotton, 967 Levitt Parkway, Rockledge, Fla., and Barney O. Rae, 4201 N. 27th Street, P.O. Box 463, Shorewood, Wis.

Continuation of Ser. No. 7,889, Feb. 2, 1970, abandoned, which is a division of Ser. Nos. 7,756, Feb. 2, 1970, , and Ser. No. 670,094, Nov. 25, 1967, Pat. No. 3,537,602, which is a division of Ser. No. 498,326, Oct. 20, 1965, Pat. No. 3,504,245. This application Nov. 12, 1971, Ser. No. 198,210
Int. Cl. B65g *1/06;* **H02p** *1/54*
U.S. Cl. 318—574 **6 Claims**

An automatic warehouse system which allows an operator to sit at a fixed station and by placing punched cards into card readers and pressing a "GO" button can cause a fork to take one article from a pickup station into storage and to retrieve any other article from storage on its return trip and bring it to a selected set-down station and then return to the starting point. Depending upon the information punched on the card, it can skip either the storage or the retrieval operation and



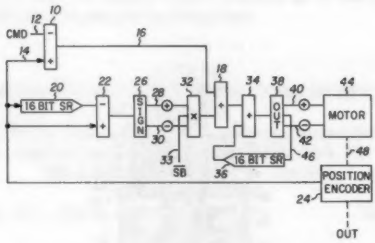
perform the other or it can cause the fork to move an article from any rack in the warehouse to any other rack without returning to the pick-up or set-down stations. In performing these movements in three dimensions, the system is provided with apparatus which recalculates the position of the fork every step of the way so as to eliminate any error that may occur.

3,723,842

DIGITAL SERVO MOTOR CONTROL WITH AN ERROR RATE DERIVATIVE CIRCUIT

Dalaine C. Sather, Cedar Rapids, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed March 9, 1972, Ser. No. 233,197
Int. Cl. G05b *19/28*
U.S. Cl. 318—602 **6 Claims**



A serial digital word circuit utilizing basic summing, multiplying, sign detection and overflow detection circuits for providing an error rate derivative circuit. The error rate derivative is accomplished by comparing a present digital word time serial digital word feedback signal with a previous digital word time serial digital word feedback signal and adding this to a comparison of the feedback signal and a command signal. As the feedback signal indicates a controlled condition is approaching the commanded condition, the sum of the added digital words reduces in magnitude and thus the effect of the control signal is more rapidly reduced as the condition reaches a desired value.

3,723,843

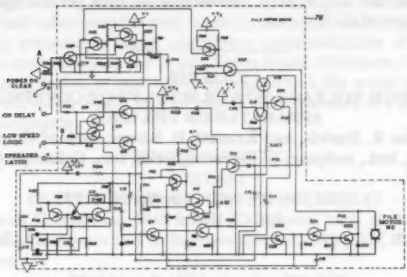
ELECTRICAL BRAKING FOR A D.C. SERVO MOTOR CONTROL CIRCUIT

Samuel Reader Pearson, Farmers Branch, Tex., assignor to Texas Instruments Incoporated, Dallas, Tex.

Filed Jan. 5, 1971, Ser. No. 103,967
Int. Cl. G05b *5/01*
U.S. Cl. 318—612 **8 Claims**

A circuit is disclosed for controlling operation of a DC shunt field motor that is utilized to drive a variable load, and

stop the motor so that the load is accurately positioned at a preselected location. Logic circuitry controls the motor speed



to a regulated low speed when the load approaches the desired location. An integrator circuit controls application of dynamic braking to stop the motor when the load is correctly located.

3,723,844

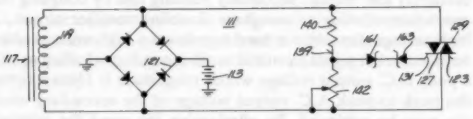
BI-DIRECTIONAL VOLTAGE CONTROL FOR PERMANENT MAGNET ALTERNATOR

David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed March 29, 1971, Ser. No. 128,816

Int. Cl. H02j *7/14*

U.S. Cl. 320—59 **12 Claims**



Disclosed herein is a battery charging circuit comprising solid state means electrically connected across an alternating voltage generating means, including a triac and bi-directional breakdown means connected to the gate of the triac, and operable, in the event of generation of voltage above a predetermined level, for limiting voltage output of the voltage generating means.

3,723,845

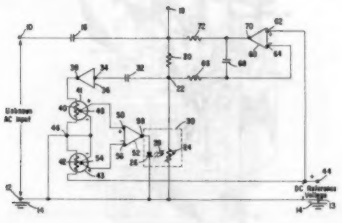
TRUE RMS TO DC CONVERTERS

James J. Duckworth, Morris Plains, N.J., assignor to Ballantine Laboratories, Inc., Boonton, N.J.

Filed July 16, 1971, Ser. No. 163,231

Int. Cl. H02m *7/00*

U.S. Cl. 321—1.5 **20 Claims**



An apparatus for converting a complex AC voltage wave to an equivalent DC value which is a measure of its true RMS value and which may then be read on an accurate indicating device such as a digital voltmeter, incorporating thermal converters and operational amplifiers in a temperature-compensated configuration. The apparatus maintains a portion of an unknown AC voltage wave, which is thermally converted into a DC voltage, substantially equal to a DC reference voltage. A portion of a DC output voltage is also maintained substantially equal to the DC reference voltage. Since the proportioning means for the complex AC voltage wave and the DC output voltage is the same, the true R.M.S. value of the complex AC voltage wave is equal to the DC output voltage.

3,723,846

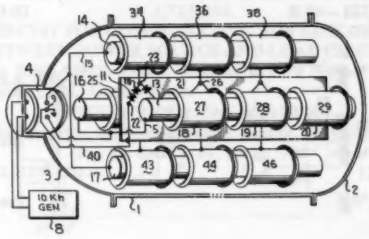
HIGH VOLTAGE POWER SUPPLY

Chester C. Thompson, Jr., Roslyn Heights, N.Y., assignor to Radiation Dynamics, Inc., Westbury, L. I., N.Y.

Filed March 15, 1972, Ser. No. 234,748

Int. Cl. H02m *7/24;* **H01g**

U.S. Cl. 321—15 **10 Claims**



A power supply for high voltage accelerators employs a plurality of elongated cylindrical capacitors, disposed circumferentially about a plurality of centrally located solid state rectifiers. The plates of each capacitor comprise inner and outer coaxial sleeves located in a gaseous atmosphere with A.C. applied to the inner sleeves to provide large effective spacing between the A.C. driven sleeves of the capacitors, the inner sleeves being shielded from one another by the outer sleeves. Solid state rectifiers require lower driving frequencies than are normal in such supplies. Output voltage loss resulting from use of lower frequencies is compensated by the large capacitance achieved and the use of a lesser number of rectifier stages. Peak inverse voltage limitations of the rectifiers are met by cascading rectifiers per stage, the large central space provided by the capacitor structure providing the space necessary for cascading.

3,723,847

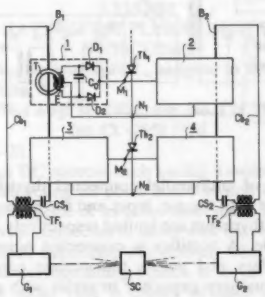
SEMICONDUCTOR SYSTEM REDUNDANT CONTROL ARRANGEMENT

Jean Chaupit, 92 Fontenay-aux-Roses, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed July 1, 1971, Ser. No. 158,945

Int. Cl. H02m *7/00*

U.S. Cl. 321—27 R **9 Claims**



An arrangement for controlling the operation of a series, parallel, or series-parallel connected assembly of semiconductor devices comprising at least two generators for providing

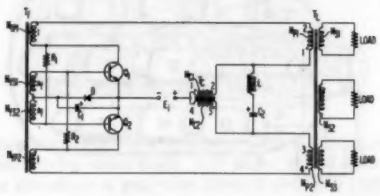
control signals at respective predetermined control frequencies and controlled by a common source, and a respective general control circuit supplied with the control signals by each generator and being at least in part tuned to the respective predetermined control frequency, each general control circuit being arranged to supply the control signals simultaneously to all the semiconductor devices.

3,723,848

ELECTRICAL POWER INVERTER WITH SINUSOIDAL OUTPUT

Edward J. Miller, Littleton, Colo., assignor to Martin Marietta Corporation, Washington, D.C.

Filed April 17, 1972, Ser. No. 244,690
Int. Cl. H02m *7/52*; **H03k** *3/281*; **H03b** *5/00*
U.S. Cl. 321—45 R **10 Claims**



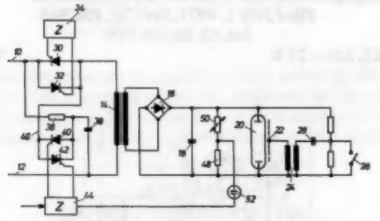
An improved inverter circuit developing sinusoidal output signals in response to dc input signals without the use of filters external to the inverter circuit. The inverter includes a commutator transformer and resonant circuit in the primary side of a load transformer. Periodic inverting of the dc signal is accomplished using switching transistors and a feedback transformer coupled to the commutator transformer and resonant circuit through the primary of the load transformer.

3,723,849

CIRCUIT ARRANGEMENT FOR CHARGING A STORAGE CAPACITOR

Wolfgang Ludloff, Porz-Westhoven, Germany, assignor to Multiblitz Dr. Ing. D. A. Mannesmann GmbH, & Co. KG., Porz-Westhoven, Germany

Filed May 4, 1972, Ser. No. 250,379
Claims priority, application Germany, May 14, 1971, P 21 23 912.3
Int. Cl. H02m *7/20*
U.S. Cl. 321—18 **8 Claims**



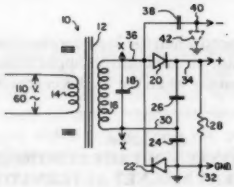
A first pair of antiparallel connected thyristors are connected in series with the a.c. input and the primary of a transformer. These thyristors are ignited respectively at the start of each half cycle. A rectifier is connected across the transformer secondary and across the storage capacitor to be charged. An auxiliary capacitor in series with a resistor are connected across the a.c. input. A second pair of antiparallel thyristors have an ignition device. The latter ignition device is controlled by a voltage derived from a voltage divider across the storage capacitor and ignite the second pair of thyristors some time after the start of successive half cycles. When ignited the respective second thyristor applies the voltage of the auxiliary capacitor across the first pair of thyristors in opposition to the a.c. voltage thereacross to turn off the ignited thyristor of the first pair.

3,723,850

HIGH VOLTAGE POWER SUPPLY FOR COPYING APPARATUS OR THE LIKE

Charles R. Daniels, and Kenneth D. Kinzer, both of Huntington, Ind., assignors to Ferromagnetics, Inc., Columbia City, Ind.

Filed July 23, 1971, Ser. No. 165,653
Int. Cl. H02m *7/42*
U.S. Cl. 321—47 **18 Claims**



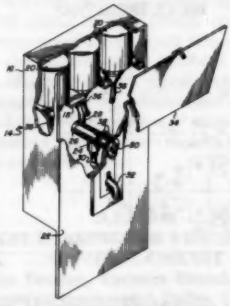
An unusually compact and efficient high voltage power supply of the saturable-core and resonant-secondary type is achieved by combining a high voltage secondary winding and a resonant-secondary winding into one relatively efficient yet relatively low voltage secondary winding and by coupling this secondary winding to a voltage doubling rectifier circuit. A high voltage capacitor is used to extract a high voltage alternating current signal from this same secondary winding so that a peak D.C. output voltage whose magnitude is 1½to 2 times the peak-to-peak A.C. output voltage of the secondary winding may be achieved. By eliminating the need for multiple windings, this power supply can compact all of its elements, including the rectifier circuit, into a space that is substantially smaller than the space occupied by the transformer alone of a conventional power supply.

3,723,851

BEVERAGE MIXER AND DISPENSER

Dale W. Johnson; Robert B. Grounds, and Donald C. Langford, all of Phoenix, Ariz., assignors to D. B. F. D. Enterprises, Phoenix, Ariz.

Filed March 15, 1971, Ser. No. 124,019
Int. Cl. B67d *5/60*
U.S. Cl. 272—132 **6 Claims**



A beverage mixer and dispenser utilizing a bottled water holding cabinet which supports a water container and a plurality of flavor liquid containers; all of said containers being disposed for gravity-responsive delivery of liquids therefrom;

and a dispensing and mixing valve below all of said containers; said valve having a rotatable and reciprocable valve member which may be rotated to any one of several selective positions communicating with any one of said flavor liquid containers; and said valve member may be reciprocably actuated against spring pressure to cause concurrent communication of said water container and one of said flavor liquid containers with a common outlet, of said valve, through which the water and a selected flavor liquid may be mixed and dispensed to a drinking receptacle.

3,723,852

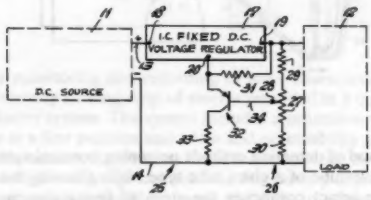
OUTPUT VOLTAGE ADJUSTING CIRCUIT

Thomas G. Peterson, and Irving J. Giguere, both of Bristol, Conn., assignors to The Superior Electric Company, Bristol, Conn.

Filed May 5, 1972, Ser. No. 250,592

Int. Cl. G05f 1/60

U.S. Cl. 323—8 **5 Claims**



A circuit connectible to an integrated circuit fixed voltage D.C. regulator for providing an adjustable value of output voltage to a load, especially a load consisting of an incandescent lamp.

3,723,853

SCR TAP CHANGING VOLTAGE REGULATOR

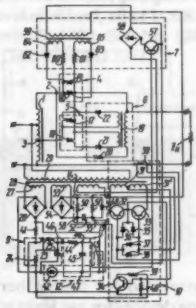
Sigizmund Semenovich Okun; Boris Nikolaevich Sergeenkov; Valentin Mikhailovich Kiselev, all of Moscow; Vasily Sergeevich Ivanov, Leningrad, and Vladimir Yakovlevich Vorobiev, Krasnogorsk Moskovskoi oblasti, all of U.S.S.R., assignors to Moskovsky ordent Lenina Energetichesky Institut, Moscow, U.S.S.R.

Filed March 22, 1972, Ser. No. 236,814

Claims priority, application U.S.S.R., Jan. 13, 1970, 1393168

Int. Cl. G05f 1/20

U.S. Cl. 323—20 **2 Claims**



Voltage regulation is effected by means of a transformer with its taps connected to alternately switched silicon controlled rectifiers. One rectifier corresponds to a lower voltage in the load circuit and is driven to a conducting state at the beginning of each half-cycle, while the other operates at a higher voltage in the load circuit. For regulation the input voltage and output current phases are compared and a signal proportionate to this phase difference is formed which is added to the average input voltage. At the same time, the input voltage is integrated for each time instant. The total voltage is compared with the reference voltage to obtain a difference signal which, in its turn, it compared with the integrated voltage, and the higher voltage rectifier is driven into conduction after the difference resulting from this comparison attains a preset level. The regulator includes an integrator, an adder, a difference voltage detector, and a reference voltage source which are connected to form a control system of the pulse-width modulator rendering the rectifier conductive at a higher voltage in the load circuit.

3,723,854

CIRCUIT FOR COMPENSATING FOR LINE DROP BETWEEN POWER SOURCE AND LOAD CIRCUIT

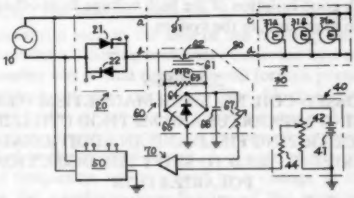
Hiroshi Kita, Shiga, Japan, assignor to New Nippon Electric Company Ltd., Osaka, Japan

Filed Aug. 9, 1971, Ser. No. 170,057

Claims priority, application Japan, Sept. 2, 1970, 45/77288

Int. Cl. G05f 1/44; H02h 3/08

U.S. Cl. 323—20 **12 Claims**



A load is energized from an alternating current source by way of a conduction angle control circuit controlled by a phase control circuit. A detected signal proportional to the load current is positively fed back to the conduction angle control circuit to automatically compensate for the voltage drops in the power feed path for the load. A protecting circuit may be connected to generate a negative signal when the supply voltage exceeds a determined value with respect to the normal load current due to the capacity of the load.

3,723,855

SYSTEM HAVING FAST PLURAL HIGH VOLTAGE SWITCHING

Paul Shuleshko, Rochester, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 16, 1971, Ser. No. 171,983

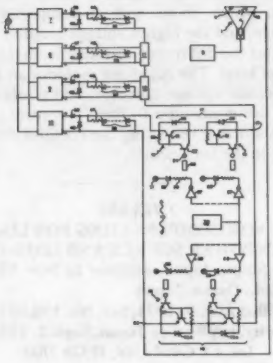
Int. Cl. G05f 1/56

U.S. Cl. 323—21 **12 Claims**

High voltage DC sources each having a switch for connecting and disconnecting its poles and a switch for connecting and disconnecting one of its poles from itself. Each switch of the former sort is connected in series with the rest thereof, and is open or closed depending respectively whether or not the voltage of the corresponding source is to be utilized. Each switch of the latter type is closed or open depending on, respectively, whether or not the voltage of the corresponding switch is to be utilized.

Each source has a zener diode string permanently connected across it. Each switch, likewise, has a diode string con-

nected across it, and is composed of a series of switching transistors, each of which has a diode of the latter diode string connected between its emitter and collector electrodes. The net effect of the diodes is to provide for fast change in voltage level under all conditions.



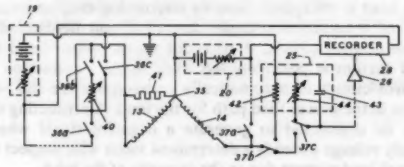
The switching transistors are opto-electronically controlled for adaptation to use in systems like multi-color graphic display systems using beam penetration tubes wherein voltage level switching at high repetition and slewing rates is required, along with good isolation of the high voltage from other potentials, close to ground, in the system.

3,723,856

CROSSED-COIL NUCLEAR MAGNETISM WELL LOGGING APPARATUS AND METHOD UTILIZING A POLARIZING FIELD AND AN ADDITIONAL POLARIZING FIELD TO SHIFT THE DIRECTION OF POLARIZATION

Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed April 9, 1971, Ser. No. 132,716
Int. Cl. G01n *33/08*
U.S. Cl. 324—0.5 G **12 Claims**



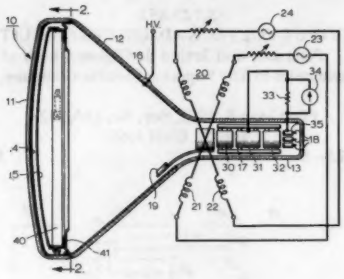
A crossed-coil nuclear magnetism well logging apparatus and method is designed to function efficiently at magnetically equatorial regions of the world, as for example in Venezuela, and in slanted boreholes where the earth's magnetic field is substantially perpendicular to the axis of the borehole. When a polarization field H_p is established in the earth formation, the protons of the formation fluids can acquire nuclear magnetism polarization M. After the occurrence of a predetermined polarizing period, T_{pc}, the polarizing field H_p is removed in the presence of a rather weak polarizing field, Hl, (generated by passing a polarizing current through the receiving coil) at a select decay rate, i.e., adiabatically, not rapidly, so that the directions of the nuclear magnetic polarization M can be angularly and adiabatically shifted to new directions prior to precession about the earth's field. In order to provide adiabatic shifting of the polarization M, the resultant magnetic field H_r formed between the collapsing polarizing H_p and Hl fields must rotate at a rate that is small compared to the Larmor frequency of the protons in the $H_r$field.

3,723,857

METHOD OF DETECTING CATHODE POISONING CONTAMINANTS IN A CATHODE RAY TUBE

Anthony Kloba, Bensenville, and Roy Maskell, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 17, 1972, Ser. No. 227,167
Int. Cl. G01r *31/22*
U.S. Cl. 324—20 CR **5 Claims**



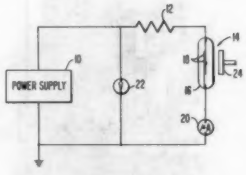
A method of detecting cathode poisoning contaminants in a cathode-ray tube of a given tube type while allowing the tube to remain intact comprises the steps of first measuring the cathode emission of the cathode-ray tube to establish a first reading. Suspected contaminated areas of the cathode-ray tube are then subjected to electromagnetic radiation for a predetermined time, after which, the cathode emission of the cathode-ray tube is re-measured to establish a second reading. Thereafter, the percentage change of the first and second readings is compared to a predetermined standard. The cathode-ray tube is considered to be contaminated if the comparison represents a percentage decrease in cathode emission which exceeds the predetermined standard.

3,723,858

METHOD FOR TESTING HERMETICALLY ENCLOSED, ELECTRICAL SWITCHING DEVICES FOR LEAKS

Douglas E. Moister, Jr., Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 20, 1971, Ser. No. 209,536
Int. Cl. G01r *31/02*; G01n *27/62*
U.S. Cl. 324—28 RS **5 Claims**

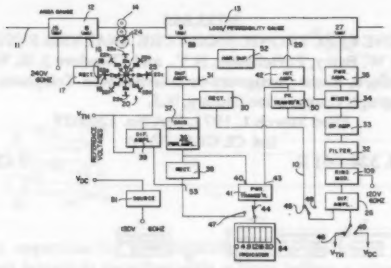


A method is provided for testing hermetically enclosed, electrical switching devices for gas leaks wherein current flowing through a resistor and the contacts of a device under test is measured with the contacts closed and again after the contacts have been opened, the sole potential applied across the series circuit being of sufficient amplitude to ionize the gas between the opening contacts, the ratio of the two current measurements reflecting the gas content of the device under test.

3,723,859
TESTING APPARATUS HAVING IMPROVED MEANS FOR MEASURING PERMEABILITY AND SPECIFIC LOSS IN A MOVING STRIP OF METAL

Stephen C. Leonard, Cheshire, Mass., assignor to General Electric Company

Filed July 6, 1971, Ser. No. 159,938
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 R **7 Claims**

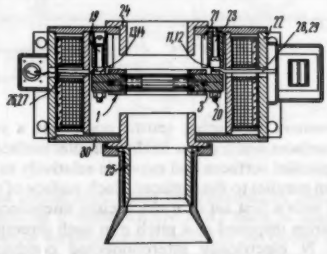


The monitoring and recording of steel characteristics in a continuously moving strip of steel is provided in a continuous strip tester system. The system includes a saturation thickness gauge at a first position and a loss and permeability gauge at a second position. A thickness indication produced by the saturation thickness gauge controls the flux density of the steel at the loss and permeability gauge through an automatic flux density control system.

3,723,860
MAGNETIC SENSOR FOR DEFECTS UTILIZING SPLIT RING COILS AND HAVING MEANS FOR DRAINING SCALE THEREFROM

Andrei Dmitrievich Lovlya, ulitsa Stalevarov, 4b, kv. 39; Igor Illarionovich Kazakevich, prospekt Lenina, 28, kv. 44; Nikolai Ivanovich Gribalev, ulitsa Sotsialisticheskaya, 22/II, kv. 6; Vladimir Mikhailovich Lozhkin, ulitsa Pobedy, 20, korpus 4, kv. 37, all of Elektrostal, Moskovskoi oblasti; Boris Ivanovich Sokolov, ulitsa Lunacharskogo, 6; Sergei Fedorovich Safronov, prospekt Lenina, 27, kv. 8, both of Noginsk, Moskovskoi oblasti; Evgeny Vasilievich Morozov, ulitsa Kommunisticheskaya, 24, kv. 18, Polerskoi, poselok Seversky, Sverdlovskoi oblasti; Vladimir Andreevich Sirota, prospekt Lenina, 23, kv. 46, Elektrostal, Moskovskoi oblasti; Vladimir Andreevich Mitkin, prospekt Lenina, 31, kv. 46, Elektrostal, Moskovskoi oblasti; Nikolai Ivanovich Kozhin, ulitsa Gorkogo, 24, kv. 58, Elektrostal, Moskovskoi oblasti, and Anatoly Dmitrievich Bratus, prospekt lenina, 26, kv. 2, Elektrostal, Moskovskoi oblasti, all of U.S.S.R.

Filed March 29, 1971, Ser. No. 128,859
Int. Cl. G011 *33/12*
U.S. Cl. 324—37 **1 Claim**



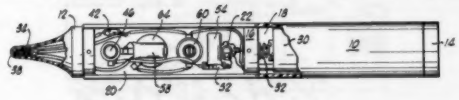
The present invention relates to devices for determining defects in rolled products and tubes and, more particularly, the invention relates to electromagnetic apparatus for detecting defects in rolled products and tubes installed in production lines of rolling mills and tube-welding units.

The invention consists in that the transducer of the apparatus is provided with three individually mounted turns, one of which is used as an inductor, while the other two are disposed at both sides of the inductor coaxially thereto and are connected differentially.

3,723,861
EDDY CURRENT TEST PROBE USING AN OSCILLATOR MOUNTED IN A DIGITALLY MANIPULATABLE HOUSING

Everett L. Samples, 2916 S. W. 60th St., Oklahoma City, Okla.

Filed Sept. 28, 1970, Ser. No. 75,977
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **7 Claims**

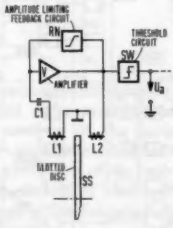


A device for eddy current testing of metals for cracks and the like including a sensing coil disposed in a contoured contact tip carried at one end of a hollow, cylindrical housing which houses electrical circuitry and a battery for powering the device. The electrical circuit is closed by plugging an earphone into a jack in the side of the housing, and the circuitry includes a blocking oscillator connected by a center tap to the sensing coil so that this single coil forms a portion of the tuned circuit of the oscillator. The blocking frequency developed by the circuit is in the audible range and is adjusted for purposes of metals testing by the use of a potentiometer connected in the control circuit. A change of the developed blocking frequency, as evidenced by a change in the signal heard at the earphone, is indicative of the presence of an anomaly in the metal under test.

3,723,862
DETECTOR FOR DETECTING OBJECTS MOVING THROUGH A MAGNETIC FIELD ESTABLISHED BETWEEN COILS OF AN L-C OSCILLATOR

Peter Wentzel, and Edwald Schulze, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed April 5, 1971, Ser. No. 130,881
Claims priority, application Germany, April 29, 1970, P 20 21 102.3
Int. Cl. G01r *33/00*
U.S. Cl. 324—41 **6 Claims**



A detector for detecting objects as they move through a magnetic field established between a transmitter coil connected to an electrical supply and a receiver coil spaced from and magnetically coupled to the transmitter coil. The receiver coil, together with a capacitor, form the oscillatory circuit of

an amplifier to provide an oscillator which oscillates to provide a high amplitude output signal in response to alteration of the magnetic field due to an object passing therethrough. The oscillator is provided with three feedback networks including one feedback network which functions as a source of alternating current which causes the oscillator to provide the low amplitude output signal. The oscillatory circuit includes a resistor for providing a highly damped operation which supports the effect of the first mentioned feedback circuit. A second feedback circuit provides constant amplification and a third feedback circuit includes the transmitter and receiver coils for effecting the regenerative function for oscillation.

3,723,863

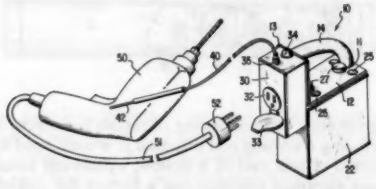
PORTABLE GROUND CONTINUITY TESTER

Raymond T. Myers, P.O. Box 2062, Fargo, N. Dak.

Filed Jan. 3, 1972, Ser. No. 214,999

Int. Cl. G01r *31/02*

U.S. Cl. 324—51 **6 Claims**



A portable ground continuity tester having a body formed of electrically conductive material and comprised of a base plate and an upstanding side wall with a handle extending therebetween. A battery is attached by a pair of terminals to the base plate and a box having a receptacle mounted therein is attached to the side wall. A test lead is attached at one end to the box and connected in series with an indicator light and the battery. A test probe on the other end of the test lead is used to contact an electrical device plugged in to the receptacle during testing whereby the light is illuminated when continuity exists.

3,723,864

METHOD AND APPARATUS FOR DETERMINING THE EXISTENCE OF A DEFECT IN AN ELECTRICAL LINE AND ITS LOCATION

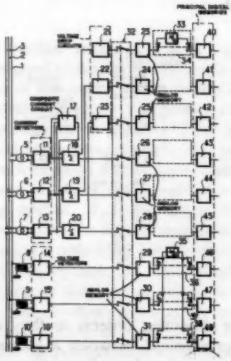
Louis Ricard, Villeurbanne, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed March 15, 1971, Ser. No. 124,151

Claims priority, application France, March 13, 1970, 7009181; March 27, 1970, 7011296

Int. Cl. G01r *31/08*

U.S. Cl. 324—52 **6 Claims**



The surveillance device according to the invention determines a resistance R_d of a defect and its distance x from a measurement point and relates them to a pre-established surveillance contour. Analog memories, containing the analog input signals, are — by means of converters — connected to digital memories which themselves are connected, by means of a set of switches, to a calculation means which makes simple calculations and comparisons. The speed of execution permits the surveillance — during an interval of time less than one quarter of a period — of the large number of lines issuing from one station.

3,723,865

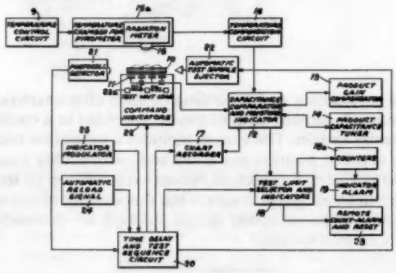
ON-LINE ELECTRONIC MOISTURE ANALYSIS SYSTEM

Robert W. Batey, Portchester, N.Y., and Theodore J. R. Welte, Stamford, Conn., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed March 1, 1971, Ser. No. 120,027

Int. Cl. G01r *27/26*

U.S. Cl. 324—61 R **7 Claims**



A moisture analysis system is provided to analyze and determine the moisture content of uniformly baked goods according to predetermined standards. The dielectric properties of the goods are tested by using a fringe field electrode and a comparator. The temperature of the goods is measured, and a compensation signal provided to the comparator so that a direct moisture determination may be made and recorded.

3,723,866

CAPACITIVE MOVEMENT MEASURING DEVICE

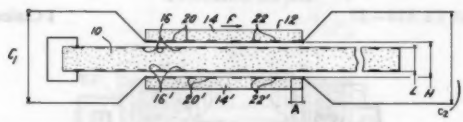
Jean-Francois Michaud, and Gilles Delapierre, both of 38 Grenoble, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed April 7, 1971, Ser. No. 131,865

Claims priority, application France, April 10, 1970, 7013098

Int. Cl. G01r *27/26*; **H01g** *7/00*

U.S. Cl. 324—61 R **7 Claims**



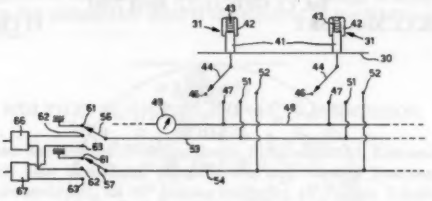
A movement measuring sensor comprises a rule having parallel surfaces and a slider having parallel surfaces opposite the first parallel surfaces and movable relatively to the rule in a direction parallel to the surfaces. Each surface of the slider is provided with a first set of *n* electrically interconnected conductive strips disposed at a pitch *p* in such direction and the rule has N electrically interconnected conductive strips disposed at the same pitch *p* and located opposite each of the first sets. The two capacitances each formed by a set of *n* strips and a set of N strips are in series relation.

3,723,867

APPARATUS HAVING A PLURALITY OF MULTI-POSITION SWITCHES FOR AUTOMATICALLY TESTING ELECTRONIC CIRCUIT BOARDS

Claudio Canarutto, 10099 San Mauro Torinese, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivreas (Turin), Italy

Filed Aug. 7, 1970, Ser. No. 62,079
Claims priority, application Italy, Aug. 7, 1969, 52924 A/69
Int. Cl. G01r *15/12, 31/02*
U.S. Cl. 324—73 PC 2 Claims



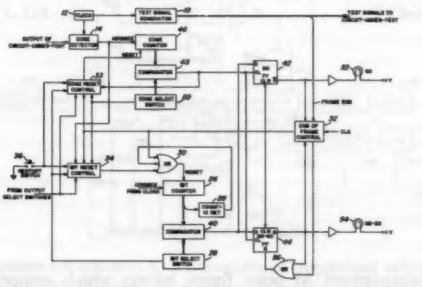
An apparatus for automatically testing electronic printed circuit boards is provided with a plate having a plurality of resiliently biased contacts disposed in the same configuration as the connecting positions of the board to be tested. Under manual control, the circuit board is moved toward the plate to bring the contacts against the corresponding connecting positions. Each of the contacts is associated with a common terminal of a multi-position switch having a plurality of selectable terminals. One of the selectable terminals of each multi-position switch is connected to a computer for selectively sensing the electrical conditions of the terminal. The other selectable terminals are connected to a plurality of means for generating input conditions, and the computer includes means for selectively connecting the contacts to one of the input condition generating means in a manner to isolate each of the circuits functionally in succession in order to test them individually. The computer further includes memory devices to store the test program and data sets relating to the testing of a number of different types of circuit boards. The data set for a particular type of circuit board is manually selected by means of a keyboard, and the results of the test are automatically printed.

3,723,868

SYSTEM FOR TESTING ELECTRONIC APPARATUS

Billy K. Foster, Winter Park, Fla., assignor to General Dynamics Corporation, Rochester, N.Y.

Filed Jan. 21, 1972, Ser. No. 219,730
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 AT 13 Claims



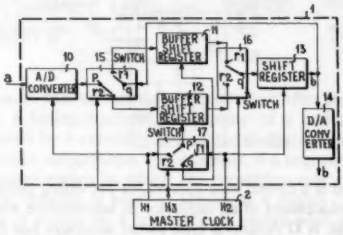
A printed circuit card tester for dynamically testing digital logic circuits on a visual GO/NO-GO basis is described. A repetitive set of waveforms is supplied to the circuit under test as stimuli therefor. Digital logic circuitry performs analysis of an output from the circuit under test which involved the counting of predetermined numbers of clock pulses during preselected timing intervals to determine the precise time interval between distinct edges (transitions) of the output from the circuit under test and to provide GO/NO-GO indications while the circuit under test is being dynamically exercised.

3,723,869

DEVICES FOR CARRYING OUT SPECTRAL ANALYSIS

Joel Guyot, Paris 8eme, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 4, 1972, Ser. No. 223,613
Claims priority, application France, Feb. 5, 1971, 7103963
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 B 10 Claims



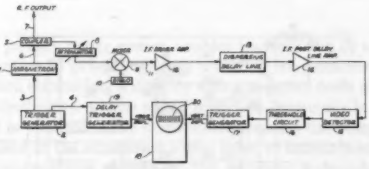
The selectivity of a spectral analysis is increased by using a factor of compression of sampled sections of an electrical signal, having a value such that the duration of each section is lengthened, and the corresponding cycle comprises a sequence of the same compressed section, the sequence amplitude-modulates the identical frequency bands distributed synchronously within one and the same cycle of a linearly frequency-modulated reference signal. The modulation product is applied to a matched dispersive delay line.

3,723,870

DEVICE FOR MEASUREMENT OF PULSE-TO-PULSE CARRIER FREQUENCY SHIFT

Thomas H. Donahue, Los Angeles, Calif., assignor to International Telephones and Telegraph Corporation, New York, N.Y.

Filed Nov. 18, 1970, Ser. No. 90,577
Int. Cl. G01r *23/02, 23/16*
U.S. Cl. 324—82 8 Claims

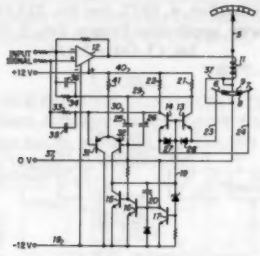


A system for the instantaneous measurement of the carrier frequency in a pulsed radar system, particularly useful in frequency stability analysis of the output of self-excited microwave frequency generators, such as magnetrons, etc. A dispersive delay line, preferably of the type operative in the intermediate frequency domain is employed with appropriate down-conversion ahead of the delay line input. A cathode ray display device horizontal sweep is generated synchronously with the magnetron PRF and the output of the dispersive delay line is presented in the appearance of spectral lines on the vertical deflection coordinate thereof. The dispersive delay line inherently provides a frequency time delay conversion so that the cathode ray display device may be calibrated in terms of frequency.

3,723,871
SERVO STABILIZED METER APPARATUS

Wesley G. Runyan, Cedar Rapids, and Lewis E. Staley, Marion, both of Iowa, assignors to Collins Radio Company, Dallas, Tex.

Filed Jan. 10, 1972, Ser. No. 216,515
Int. Cl. G01r *17/06*; H01g *5/10*
U.S. Cl. 324—99 R **7 Claims**

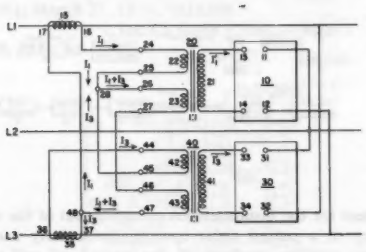


Disclosed is a closed loop system for providing precise, stabilized displacement of an indicator in accordance with command signal. A D'Arsonval type meter structure has first and second stationary electrically conductive plates mounted on and insulated from the magnetic core structure. Each plate has a portion thereof disposed between the conductive bobbin on which the armature coil is wound and the magnetic core structure so that when the bobbin moves in either direction the capacitive coupling between the bobbin and one of the plates increases as the capacitive coupling between the bobbin and the other plate decreases. Means are provided for differentially sensing the capacitance between the bobbin and each of the two plates to develop an error signal proportional to armature displacement and for summing the error signal with the input or command signal to the armature coil to drive the indicator to the correct position.

3,723,872
THREE-WIRE, THREE-PHASE WATT-VARMETER

Harold Rich, Lynn, Mass., assignor to General Electric Company, Lynn, Mass.

Filed Nov. 8, 1971, Ser. No. 196,435
Int. Cl. G01r *11/00, 21/00*
U.S. Cl. 324—141 **15 Claims**

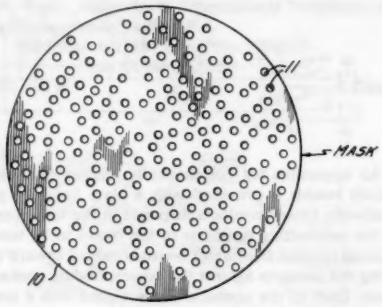


A power measuring circuit. A circuit for measuring three-phase real or reactive power utilizing two wattmeter circuits without employing additional phase shifting networks. The current input of each wattmeter circuit is driven from a current transformer having two primary winding sections having an equal number of turns. Watts are measured using the standard two-wattmeter method. When measuring VAR's, the voltage connections are exchanged and the primary windings of the current transformer so interconnected that a first line current flows through both primary windings of a first current transformer and one primary winding of the second current transformer and a second line current flows through both primary windings of the second transformer and one primary winding of the first current transformer.

3,723,873
RADIATION METHOD FOR DETERMINING SEMICONDUCTOR STABILITY AND RELIABILITY

Abraham A. Witteles, Parsippany-Troy Hills, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,536
Int. Cl. G01r *31/22*; H01l *7/00*
U.S. Cl. 324—158 T **11 Claims**

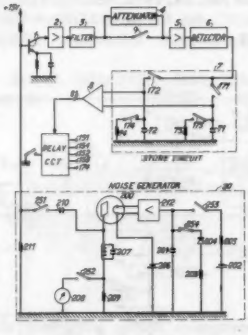


A semiconductor wafer is tested for stability and reliability by subjecting preselected chips on the wafer to a predetermined dose of ionizing radiation and measuring the resulting change in electrical operating parameters of the preselected chips to obtain an indication of the general stability and reliability of the entire wafer being tested.

3,723,874
NOISE FIGURE METER

Bernard Hamon, Conflans-Sante-Honorine, and Jean-Pierre Montel, Meulan, both of France, assignors to Lignes Telegraphiques Et Telephoniques, Paris, France

Filed Jan. 31, 1972, Ser. No. 222,250
Claims priority, application France, Feb. 2, 1971, 7103375
Int. Cl. G01r *31/22, 27/00*
U.S. Cl. 324—158 T **3 Claims**



Improvement to noise figure meters which comprise a broadband noise power source in the form of a temperature limited diode having an output resistor forming the input resistance of an amplifier device to be tested, switching means for selectively connecting the output of said diode to said resistor and for cumulating the noise power created by the diode and the noise power of the amplifier device, a pass-band filter connected to the output of the amplifier device, an attenuator

having an attenuating factor of 2, switching means for selectively inserting the attenuator at the output of the filter, a detector for detecting the noise power of the amplifier device alone and the cumulated noise power of the noise source and amplifier device attenuated by 2 and for deriving therefrom two RMS noise signals, two capacitors for respectively storing said RMS noise signals and a comparator for determining the equality of said signals. The improvement consists of a capacitor-resistor charge circuit and an amplifier of the charging current of the capacitor. The amplified current is applied to the heater of the diode and the charge is stopped when the comparator detects the equality of the RMS noise signals.

3,723,875

MULTILEVEL DIGITAL SIGNAL TRANSMISSION SYSTEM

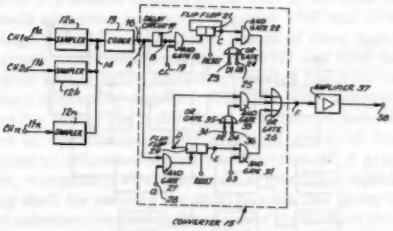
Masao Kawashima, Yokohama-shi; Mikio Ohtsuki, Kawasaki-shi; Isao Fudemoto, Machida-shi, and Kiyoshi Tomimori, Kawasaki-shi, all of Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan

Filed March 3, 1969, Ser. No. 803,680

Claims priority, application Japan, March 9, 1968, 43/15293

Int. Cl. H04b 7/18, 1/00

U.S. Cl. 325—13 **6 Claims**



Multilevel digital signals are converted to binary signals and are transmitted as such. The binary signals are integrated by the frequency characteristic of a transmission line of narrow bandwidth. The transmission line converts the binary pulses to a multilevel signal. The receiver receives the transmitted multilevel signal and converts it to analog signals.

3,723,876

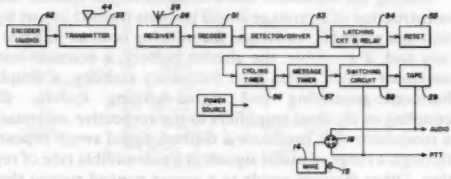
EMERGENCY DISTRESS SIGNALING SYSTEM

George C. Seaborn, Jr., 926 Warfield, Richardson, Tex.

Filed June 21, 1971, Ser. No. 155,098

Int. Cl. H04b 1/00

U.S. Cl. 325—64 **7 Claims**



A system for addition to a conventional dispatched vehicle two-way radio communication system to enable an operator to notify a central dispatcher of an emergency condition arising after the operator leaves the vehicle. The system includes a unit which plugs directly into the microphone input of the conventional system and which is responsive to a signal transmitted from a portable transmitter carried by the operator for playing a pre-recorded emergency message through the transmitter of the conventional radio system.

3,723,877

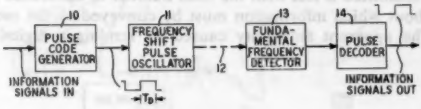
TRANSMISSION OF SIGNALS CONTAINING HARMONICALLY RELATED SIGNALS TO OVERCOME EFFECTS OF FADING

Ralph La Rue Miller, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 3, 1970, Ser. No. 69,373

Int. Cl. H04l 27/10

U.S. Cl. 325—30 **4 Claims**



To ensure that signals may be recovered after transmission through a fading medium, each pulse of a coded signal is represented by a carefully formulated collection of harmonically related components. For example, if a sequence of regularly spaced pulses in which the repetition rate determines harmonic spacing is used to represent a binary "one," the absence of pulses or a sequence of pulses with a different repetition rate then represents a "zero." A harmonic detector is used to recover the fundamental component of each group. The fundamental frequency identifies the transmitted code signal. Superior signal recovery despite fading, noise, or phase dispersion results.

3,723,878

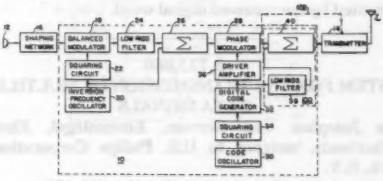
VOICE PRIVACY DEVICE

Charles K. Miller, Concord, Mass., assignor to Technical Communications Corporation, Lexington, Mass.

Filed July 30, 1970, Ser. No. 59,659

Int. Cl. H04k 1/04

U.S. Cl. 325—32 **26 Claims**



A voice privacy coder system enables transmission of voice communication in privacy by first inverting the communication and then scrambling it directly with a complex code word. In one embodiment, a tone at the inversion frequency is also scrambled in with the voice communication and the complex code is added to the scrambled signal prior to transmission to provide synchronizing signals for the receiver; a decoder at the receiver reconstitutes the scrambled communication. In an alternate embodiment, the complex code is omitted from the transmitted signal and the inversion tone and code are reconstituted at the receiver by means of cross-coupled phase-lock and synchronizing loops.

3,723,879

DIGITAL DIFFERENTIAL PULSE CODE MODEM

Pradman P. Kaul, Washington, D.C., and Leonard S. Golding, Rockville, Md., assignors to Communications Satellite Corporation, Washington, D.C.

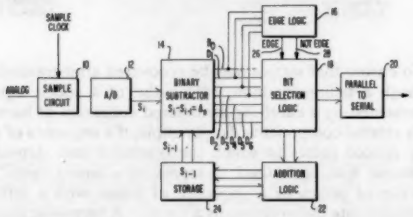
Filed Dec. 30, 1971, Ser. No. 214,271

Int. Cl. H04b 1/66

U.S. Cl. 325—38 R **22 Claims**

A differential pulse code modem receives digitally quantized samples of an input analog signal and produces digital

words or codes representing difference levels. Each output word represents the difference between successive input samples. A comparable differential pulse code modem receives the digital words representing difference levels and reconstructs the original quantized samples. The quantized samples are then reconverted into a replica of the original analog signal. The bit rate of a communications system using said modem is reduced by transmitting digital words, some of which uniquely represent a single difference level, and some of which represent two distinct difference levels. Thus the total number of unique digital output words which can be transmitted is less than the total number of difference levels, about which information must be conveyed to the receiver. The apparent ambiguity caused by sending a digital word



which represents two distinct difference levels is resolved by a technique which uses the same digital word to represent only disjoint difference levels.

When subtracting a preceding sample from the present or current sample the resulting difference level cannot exceed a maximum positive or negative value determined by the dynamic range of the sample values. Two difference levels are disjoint if there exists no possible value for the preceding sample which could result in both difference levels.

The same digital word is sent out whether the difference level information to be conveyed is the first or the second difference level. The reconstructed prior sample provides the information needed to exclude one of the disjoint levels represented by the received digital word.

3,723,880

SYSTEM FOR THE TRANSMISSION OF MULTILEVEL DATA SIGNALS

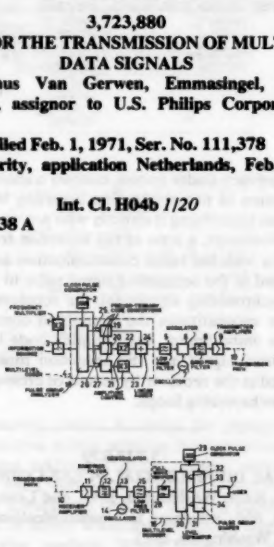
Petrus Josephus Van Gerwen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 1, 1971, Ser. No. 111,378

Claims priority, application Netherlands, Feb. 12, 1970, 7001968

Int. Cl. H04b *1/20*

U.S. Cl. 325—38 A **15 Claims**



A system for the transmission of multilevel data signals in which a multilevel coder incorporated in the transmitter includes a pulse group analyzer which is provided with m output lines which analyses pulse groups each containing k binary pulses of the binary information signals, and applies a pulse series characteristic of the analyzed pulse group to each output line which pulses are applied through a cascade arrangement of amplitude control device and pseudo-ternary code converter incorporated in each output line to a combination device from whose output a $2m + 1$ level signal is derived at a frequency spectrum in which spectral zeros occur at prescribed positions. In the receiver this signal is applied to a cascade arrangement of a full-wave rectifier and a level separator including m output lines which are applied to a pulse group shaper with which the original information signals are uniformly recovered.

3,723,881

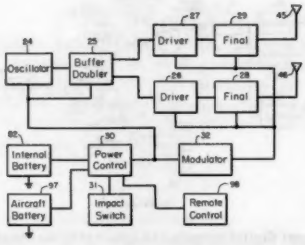
DOWNED-AIRCRAFT RADIO-LOCATOR BEACON AND RELATED APPARATUS

Jay E. Burton, Fort Collins, Colo., assignor to Drake, Crandell & Batchelder, Ft. Collins, Colo.

Division of Ser. No. 9,880, Feb. 9, 1970. This application Oct. 22, 1971, Ser. No. 191,914

Int. Cl. H04b *1/02*

U.S. Cl. 325—115 **18 Claims**



A compact dual-frequency specially-modulated radio transmitter and combined antenna assembly are mounted in an aircraft. Operation is initiated either automatically in the event of a crash or manually by a remote control, with the remote control system incorporated in a manner such that severing or shorting of its connections in a crash will not prevent automatic operation. Overall size and airdrag are minimized by sandwiching the principal transmitter components between a ground plane and a loop-shaped antenna parallel thereto.

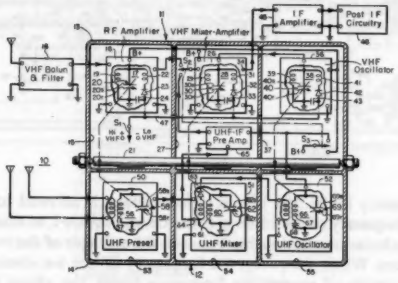
Among the numerous more-detailed improvements are the construction of interstage shield pockets formed in part by the antenna assembly, provision for utilizing both an internal battery and, if available, the aircraft battery, a constant-current oscillator which yields high frequency stability, a simplified harmonic-generating and signal-splitting system, direct coupling of the final amplifiers to the respective antennas and a modulator that produces a distress signal swept repeatedly through a range of audio signals at a sub-audible rate of repetition. Other features reside in a power control system that includes delayed actuation for the remote control to guard against false actuation, correlated arming of a firing device and discharge of the delay circuit to insure operation over a wide-range of battery voltage, similarly delayed remote turn-off control and integration into this same system of a shock-actuated or impact switch that initiates automatic operation which, in turn, can be over-ridden by the remote control in the event, for example, of an unusually severe landing shock that does not impair further operation of the aircraft.

3,723,882

MULTI-BAND TELEVISION TUNER ARRANGEMENT

Reuben C. Carlson, Bloomingdale, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Aug. 2, 1971, Ser. No. 168,230
Int. Cl. H04b 1/26
U.S. Cl. 325—357 11 Claims



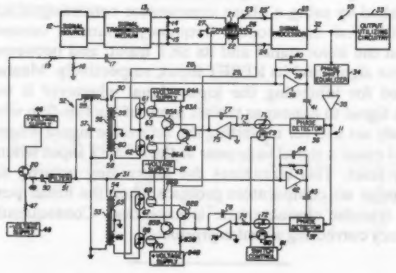
A tuning arrangement for selectively tuning a television receiver to a desired channel in the VHF or the UHF frequency bands comprises adjacently disposed VHF and UHF tuner housings. Each housing includes groups of wave signal selectors continuously tunable across the VHF and UHF bands. A rotatable tuning shaft, extending through the VHF housing, supports oppositely disposed VHF and UHF capacitor electrodes for tuning the wave signal selectors. A band selector serves to operatively couple a desired group of frequency selectors to utilization circuitry in the receiver. A presettable driver, comprising a programmer, is directly coupled to the tuning shaft for rotating the shaft to tune that group of wave signal selectors coupled to the receiver's utilization circuitry.

3,723,883

AUTOMATIC NOISE NULLING CIRCUIT

Darwin S. Renner, 1314 Cedar Hill Avenue, Dallas, Tex.

Continuation-in-part of Ser. No. 863,004, Aug. 26, 1969, abandoned. This application Feb. 23, 1972, Ser. No. 228,535
Int. Cl. H04b 1/12
U.S. Cl. 325—476 18 Claims



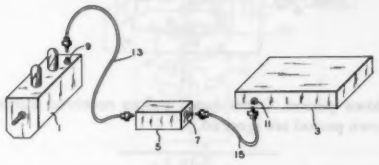
An automatic noise nulling circuit for use with a signal transmission system with noise sensed and nulled from the signal path. Noise is nulled out by a null signal input with substantially no distortion of desired signal transmission and without altering the signal transmission characteristics of the signal path through the system.

3,723,884

MODULAR FILTERS FOR TELEVISION RECEIVERS

William Asplin, 6162 Ridgewood Dr. S.W., Canton, Ohio

Filed Jan. 5, 1971, Ser. No. 104,032
Int. Cl. H04b 1/10; H04n 7/18
U.S. Cl. 325—477 1 Claim



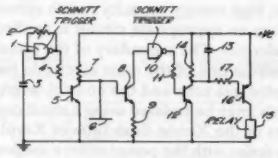
A modular filter for separate attachment to receivers between the tuner and the intermediate frequency stages comprising a compact housing containing passive electronic components connected in circuit with input and output connectors to provide electromagnetic wave filtering at variably selected frequencies.

3,723,885

CAPACITANCE PROXIMITY SWITCH

William Robert Urmenyi, 21 Church Road, Kingston on Thames, England

Filed May 3, 1971, Ser. No. 141,064
Claims priority, application Great Britain, June 17, 1970, 29271/70
Int. Cl. H03k 1/18
U.S. Cl. 328—5 5 Claims



The invention refers to a capacitance proximity switch which is more reliable than known devices. This is achieved by using a circuit which makes it possible to use digital circuits instead of linear amplifiers. The device comprises a square wave oscillator, a pulse stretcher fed by the oscillator using the capacitance between two electrically conducting bodies as at least part of the timing capacitance, means for detecting the change of mark-space ratio due to change of capacitance between the said two bodies and the means to operate a switch when the mark-space ratio differs from a predetermined value. The change of capacitance may be caused by changing the distance between the said two bodies or by approaching one or both of the bodies by a third body which latter may be a conductor or an insulator.

3,723,886

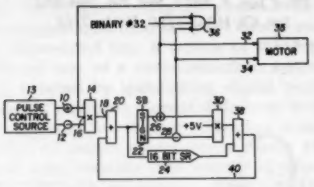
PULSE STRETCHING APPARATUS

Delaine C. Sather, Cedar Rapids, Iowa, assignor Collins Radio Company, Dallas, Tex.

Filed Feb. 11, 1972, Ser. No. 225,442
Int. Cl. H03k 5/04
U.S. Cl. 328—58 5 Claims

The present disclosure is directed toward apparatus for digitally expanding the length of a pulse. This is accomplished

by using a unique count down circuit after the reception of an input pulse. An output pulse is obtained for the duration of the



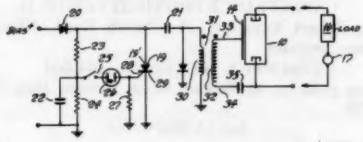
count down period. Other input pulses received during the count down period are ignored.

3,723,887

DISCHARGE FLASH TUBE HIGH ENERGY SWITCH

Joseph J. Panico, Arlington, Mass., assignor to Health Systems, Inc., Woburn, Mass.

Filed April 21, 1970, Ser. No. 30,385
Int. Cl. A61n *1/38*
U.S. Cl. 328—76 **10 Claims**



A high speed, high energy capacity switch system wherein a trigger pulse from an appropriate circuit is applied to the primary of a transformer. The secondary of the transformer may be connected across one of the main electrode terminals of a Xenon or Krypton gas tube and the control terminal thereof, or both terminals, may be isolated using a small capacitor. The main electrodes of the Xenon flash tube or Krypton gas tube are disposed in series with the power source and/or load which is to be controlled so that when the stepped-up trigger pulse is applied to the tube, it will fire and provide instant conduction of the power source current and remain in this state until the voltage and current thereacross fall below the value necessary to sustain conduction for a sufficient period of time. Additionally, there are disclosed a computer logic element wherein the switch is interposed in the memory core and the light output thereof is detected by a bank of photo diodes, a random color pattern generator wherein a series of light emitting diodes are connected in series with the switch, an overload protective device in which the current or voltage sensor controls the activation of the switch to short circuit the power source thereacross and other novel combinations.

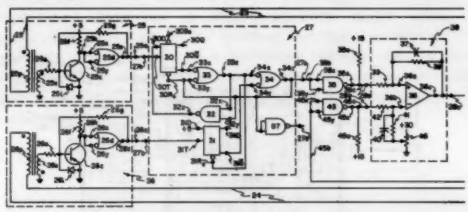
3,723,888

PHASE RESPONSIVE CONTROL CIRCUIT

Charles W. Ellis, Lorain, Ohio, assignor to Lorain Products Corporation

Filed June 14, 1971, Ser. No. 152,770
Int. Cl. H03k *5/20*
U.S. Cl. 328—134 **6 Claims**

A circuit for establishing and controlling a synchronous relationship between the voltages of two independently energized a-c sources. Two a-c voltages are applied in switching control relationship to respective inputs of a phase comparator circuit. The comparator circuit generates a pulse train having a duty cycle which is a substantially linear function of the phase angle between the voltages of the two a-c sources. A reference pulse train having a fixed duty cycle is subtracted from the variable duty cycle pulse train to establish a signal voltage that varies in accordance with the magnitude and sign of the phase angle between the voltages of the two a-c sources. When the frequency of one a-c source is within acceptable



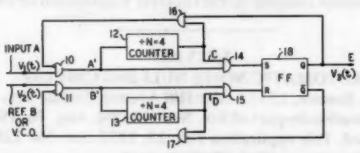
frequency limits, the above signal voltage is allowed to vary the frequency of the other a-c source, as required, to maintain a synchronous relationship between the voltages of the two a-c sources. When, however, the frequency of one a-c source varies outside of acceptable frequency limits, the above signal voltage is prevented from varying the frequency of the other a-c source which then operates at a fixed, predetermined frequency.

3,723,889

PHASE AND FREQUENCY COMPARATOR

James Francis Oberst, Howell Twp., Monmouth County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1971, Ser. No. 210,644
Int. Cl. H03d *13/00*
U.S. Cl. 328—134 **5 Claims**



A sawtooth phase comparator is arranged to act as a frequency comparator when the frequencies of the input and reference signals differ by a substantial amount. This is accomplished by using a phase comparator consisting of a flip-flop with first and second frequency counters connected between the input signal and its SET input, and between the reference signal and its RESET input, respectively. Means are provided for inhibiting the input signal whenever it would cause a signal to appear at the set input of the flip-flop when it is already set and for inhibiting the reference signal whenever it would cause a signal to appear at the RESET input when it is already reset. This eliminates the alternating polarity signal which prior art comparators produce when the linear portion of the transfer characteristic is exceeded. Consequently, a frequency correcting signal is produced.

3,723,890

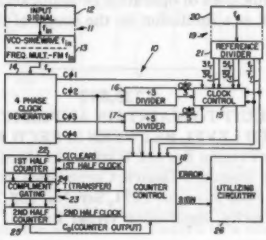
DIGITAL HARMONIC REJECTING PHASE DETECTOR

Dean P. Hutsinger, Marion, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Oct. 26, 1971, Ser. No. 192,456
Int. Cl. H03d *3/20*
U.S. Cl. 329—50 **10 Claims**

A digital harmonic rejecting phase detector inherently capable of rejecting substantially any even harmonic and with

provisions for good rejection of at least one odd harmonic present in the input signal. The detector has a bidirectional counter system with a first half unidirectional counter and a second half unidirectional counter with transfer gating periodically transferring content of the first half counter to the second half counter. The bidirectional counter system accomplishes both an invert-noninvert function and the averaging function of a low-pass filter. The input signal is processed through a signal conditioner to a pulse density representation. A reference divider is provided developing the fundamental reference frequency f_r and developing required odd harmonic reference frequencies (i.e., $3f_r$ and $5f_r$) in square wave form.



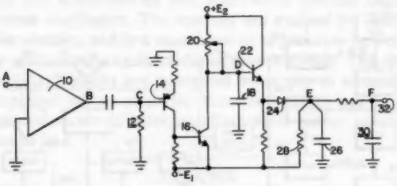
The detector processes the input signal with a VCO for a sinewave input or a frequency multiplier for an FM input and includes a multiphase clock generator, at least one clock divider (one for each odd harmonic provided for), clock and counter controls, complement gating and two detection counters. Within the detector an increment of resolution is added or subtracted by either or'ing a pulse into the clock stream or by inhibiting a pulse from the clock stream in an operational approach eliminating any requirement for separate harmonic detectors. A small amount of additional gating implements the action of an odd harmonic detector along with gating already present for the fundamental detector.

3,723,891

FREQUENCY TO VOLTAGE CONVERTER

Thomas B. Whiteley, Riverside, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed May 12, 1971, Ser. No. 143,678
Int. Cl. H03d 3/04
U.S. Cl. 329—103 **8 Claims**



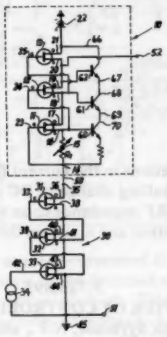
A frequency to voltage converter including a switching circuit responsive to an input signal at each zero crossing in the positive direction to charge a capacitor to a peak negative voltage and discharging through a resistor towards a positive voltage until the next zero crossing in the positive direction. The peak voltage charge is coupled to a holding circuit to provide a D.C. voltage proportional to the frequency of the input signal.

3,723,892

CIRCUIT USING DYNAMIC HIGH IMPEDANCE LOAD

Loebe Julie, New York, N.Y., assignor to Julie Research Laboratories, Inc., New York, N.Y.

Filed March 22, 1972, Ser. No. 236,823
Continuation-in-part of Ser. No. 57,140, July 22, 1970
Int. Cl. H03f 3/16
U.S. Cl. 330—35 **9 Claims**



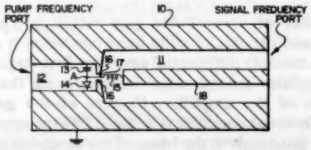
An amplifier comprising a series of field effect transistors is connected to a dynamic high impedance load. The output of the amplifier preferably is taken from the last stage of that load. The dynamic high impedance load may be a constant current source consisting of at least three field effect transistors.

3,723,893

PARAMETRIC AMPLIFIER

Lorne D. Braun, Knata, Ontario, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Aug. 6, 1971, Ser. No. 169,700
Int. Cl. H03f 7/04
U.S. Cl. 330—4.9 **7 Claims**



A parametric amplifier comprising a housing formed of conductive material defining a first cavity adapted for connection to a pump signal input at microwave frequencies and a second cavity containing a spaced central conductor and adapted for coaxial connection to a signal input and output port, said first and second cavities being connected through an aperture in the housing, a capacitor or reactance and varactor positioned in the first cavity and connected in series across two walls thereof, and an inductor positioned in the second cavity and connected to an end of the central conductor and via an electrical lead passing through the aperture to the mid-point of the series connected capacitor and varactor.

3,723,894

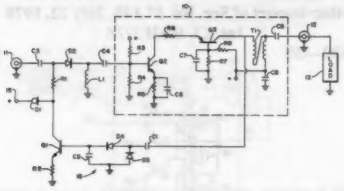
AUTOMATIC GAIN CONTROL CIRCUIT

Robert L. Benenati, Depew, N.Y., assignor to GTE Sylvania Incorporated

Filed Aug. 13, 1971, Ser. No. 171,477
Int. Cl. H03g 3/30
U.S. Cl. 330—29 **7 Claims**

VHF cascode amplifier having a PIN diode in series with its input. The RF impedance of the PIN diode varies inversely with the DC current through it. A constant DC current source

including a constant current diode supplies DC current to the PIN diode. A bypass transistor has its collector connected to the constant current source and its base coupled to the amplifier output. Variations in the peak amplitude of the amplifier



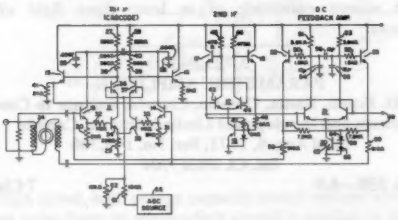
output cause variations in the current flow through the bypass transistor. The resulting change in DC current flow in the PIN diode changes its RF impedance so as to overcome the change in the amplifier output and maintain the output level constant.

3,723,895

AMPLIFIER OF CONTROLLABLE GAIN

William Peil, North Syracuse, N.Y., assignor to General Electric Company

Filed Nov. 10, 1971, Ser. No. 197,390
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **4 Claims**



An amplifier of controllable gain which is d.c. coupled throughout and capable of wide band operation is described. It employs a cascode differential amplifier first stage and a differential amplifier second stage for producing the principal voltage gain of the amplifier. Control of the gain of the cascode differential amplifier is achieved by the application of gain control potentials to the bases of the cascoded upper rank transistors. Gain reduction is successively produced by saturation of the lower rank transistors, the degenerative effects of two impedances connected in series with the base leads of the lower rank transistors, and finally by cut-off of the upper rank transistors. The resultant gain control characteristic has a steep initial, gradual central and a steep final slope. The total range of gain control is in excess of the forward gain of the amplifier. The amplifier is of high gain and wide bandwidth and is suitable for amplification at intermediate frequencies (44 megahertz) of a television signal. The circuit is adapted for integrated circuit fabrication.

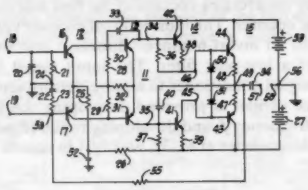
3,723,896

AMPLIFIER SYSTEM

Daniel N. Flickinger, 40 South Oviatt Street, P.O. Box 628, Hudson, Ohio

Filed Dec. 28, 1970, Ser. No. 101,494
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 R **6 Claims**

A solid state amplifier system is disclosed consisting of a driver stage having a differential input coupled to a single ended complementary symmetry output stage. The amplifier system is coupled in a manner which results in a wideband amplifier capable of a high power output at low noise and distortion. The amplifier system is temperature compensated and economical to produce. The foregoing abstract is merely a resume of one general application, is not a complete discus-



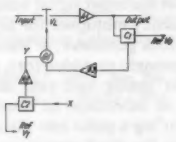
sion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,723,897

AGC CIRCUIT TO MAINTAIN AMPLIFICATION AT A FIXED LEVEL BETWEEN SPEECH BURSTS

George John Preston Barnes, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 30, 1971, Ser. No. 158,279
Claims priority, application Great Britain, July 29, 1970, 36,704/70
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **4 Claims**



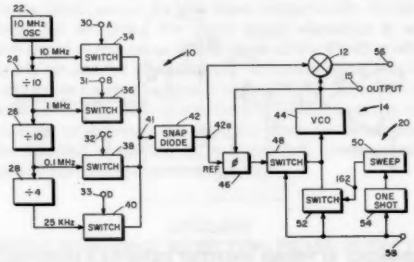
An AGC circuit for loudspeaking telephones is disclosed in which the setting of the amplifier is, in effect, "frozen" during gaps in speech at the level reached in the last speech burst. This avoids the undesirable effects on AGC systems of surges due to speech commencement.

3,723,898

FREQUENCY SYNTHESIZER

John Merle Tewksbury, Baltimore, Md., assignor to The Bendix Corporation

Filed March 31, 1972, Ser. No. 240,070
Int. Cl. H03b *3/08*
U.S. Cl. 331—4 **12 Claims**



A swept frequency synthesizer having multiple sweep speeds where the sweep speed is dependent upon the distance between the instantaneous output frequency and the desired output frequency. A harmonic generator produces a plurality of reference frequencies. The spacing between reference

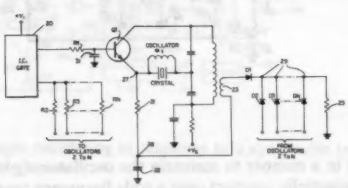
frequencies is decreased as the instantaneous output frequency approaches the desired frequency.

3,723,899

MULTIPLE OSCILLATOR ISOLATION CIRCUIT

Boyd M. McClaskey, Flourtown, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Jan. 6, 1972, Ser. No. 215,865
Int. Cl. H03b *3/00*; H03k *17/76*
U.S. Cl. 331—49 **11 Claims**



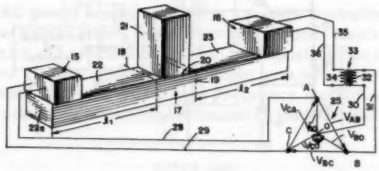
A multiple oscillator isolation circuit for driving one of such oscillators at a time, switchably connecting the output of said driven oscillator to a common buss, and isolating such driven oscillator from all the other oscillators. Each oscillator contains an active device which is connected to a control line of an IC gate, and which is in series connection with the oscillator output and an input leg of a diode gate which drives the buss, such that the energized control line both drives the oscillator and gates the oscillator output through to the common buss.

3,723,900

MICROWAVE APPLICATOR WITH TIME-SHARING OF MAGNETRON SOURCES

Ray M. Johnson, Danville, Calif., assignor to Microdry Corporation, San Ramon, Calif.

Filed Oct. 29, 1971, Ser. No. 193,902
Int. Cl. H03b *9/10*
U.S. Cl. 331—55 **6 Claims**



A multimode microwave applicator or single-mode transmission line is excited by two microwave sources including magnetron oscillators. The sources are excited by full wave rectifier circuits, and in a manner so as to generate power only during portions of a cycle of the ac power supply. The respective rectifier circuits are energized by ac power sources that are displaced 90° in phase so that the sources operate in a time-shared mode to alternately transmit power to the applicator or line.

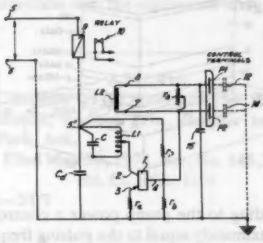
3,723,901

ELECTRONIC CONTROL DEVICE WITH CONDITION RESPONSIVE OSCILLATOR

Jean Pierre Nicolas, Nice, France, assignor to Adolf Feller Aktiengesellschaft, Horgen, Switzerland

Filed Feb. 3, 1971, Ser. No. 112,171
Claims priority, application France, Feb. 3, 1970, 7003759; Jan. 4, 1971, 7100026
Int. Cl. H01h *47/32*; H03b *5/12*
U.S. Cl. 331—65 **11 Claims**

An electronic device intended to supply an electric control signal in response to the momentary application of an impedance which may be constituted by the impedance of the human body between an input terminal and earth. The device comprising a single active amplifier element in a feedback oscillator in which the feedback circuit is completed, for example, by being touched. The active member is biased in class C so that it is virtually blocked until oscillations set in by closing the feedback circuit with the human body whereupon the active element passes into class A condition. The control



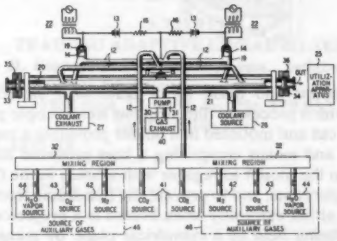
signal is formed by the average current of the active member resulting from amplification of the detected oscillations on the input electrode of the active element. This single amplifier stage produces simultaneously a feedback of the high frequency current, a detection of the peaks of this high frequency current and an amplification in direct current of the detected current, the state of oscillation continuing or not, according to a chosen mode of operation after the said impedence is no longer applied.

3,723,902

CARBON DIOXIDE LASER EMPLOYING MULTIPLE GASES INCLUDING OXYGEN AND WATER VAPOR

Chandra K. N. Patel, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Division of Ser. No. 814,510, March 28, 1969, Pat. No. 3,596,202, which is a continuation-in-part of Ser. Nos. 409,682, Nov. 9, 1964, abandoned, and Ser. No. 474,546, July 26, 1965, abandoned, and Ser. No. 495,844, Oct. 14, 1965, abandoned. This application Nov. 30, 1970, Ser. No. 93,565
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 G **8 Claims**



There is disclosed a laser providing emission of coherent radiation near 10 microns in the far infrared and utilizing transitions between vibrational-rotational levels in carbon dioxide. Also disclosed are beneficial effects from addition of oxygen and water vapor to various forms of such a laser.

3,723,903

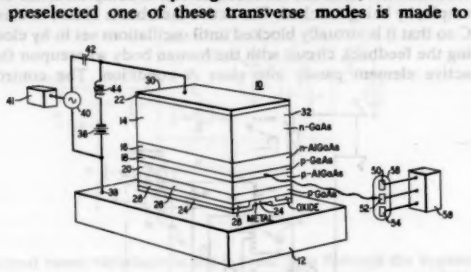
DYNAMIC FM CONTROL OF THE TRANSVERSE MODES OF A SELF-PULSING SEMICONDUCTOR LASER

Thomas Lee Paoli, Chatham, and Jose Ellis Ripper, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 13, 1971, Ser. No. 142,983
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 M **14 Claims**

A semiconductor laser at appropriate values of current above threshold, enters a nonlinear regime characterized by

(1) a continuous region in which the output radiation self-pulses simultaneously in two competing transverse modes and/or (2) a bistable region in which the output radiation self-pulses in either of two noncompeting transverse modes, but not both. A preselected one of these transverse modes is made to



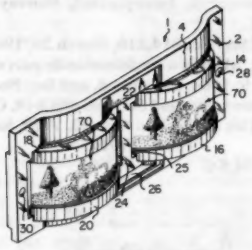
dominate by adding to the pump power a control signal at a frequency approximately equal to the pulsing frequency of the preselected mode. Alternatively, the laser is modulated (i.e., switched between different sets of modal families) by modulating the frequency of the control signal between two pulsing frequencies corresponding to different modal families.

3,723,904

FILM MOUNT AND MASK FOR A PAIR OF PANORAMIC STEREOSCOPIC IMAGES

Robert V. Bernier, Saugus, Calif., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 13, 1971, Ser. No. 188,896
Int. Cl. G09f 1/12
U.S. Cl. 40—152 **10 Claims**



A film mount and mask for a panoramic stereoscopic camera in which processed film strip has stereoscopic pairs of film frames cut and mounted in a holder providing a mask for each frame and means comprising a boss provided for each film frame in the mount to register with a notch in the film for positioning purposes, and to prevent the film frame from moving towards either extremity when heated in a projector, each film frame being held in a cylindrical plane by means of a mask, with means formed into the mount to accept either clips, or plastic feet in the case of a plastic mask, to secure the film frames tight against the curved focal plane formed in the mount, said plane being identical as to focal radius with the curved film bed in the panoramic stereoscopic camera in which the film was exposed.

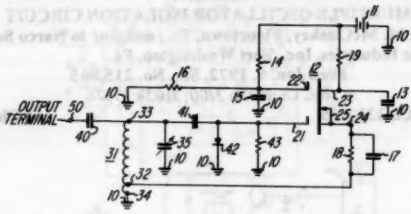
3,723,905

DUAL-GATE MOS-FET OSCILLATOR CIRCUIT WITH AMPLITUDE STABILIZATION

John Franklin Sterner, Piscataway, and George Draper Hanchett, Summit, both of N.J., assignors to RCA Corporation

Filed June 21, 1971, Ser. No. 154,825
Int. Cl. H03b 3/02, 5/12
U.S. Cl. 331—109 **3 Claims**

An oscillator circuit includes a dual-gate MOS field-effect transistor arranged in a Hartley oscillator configuration and



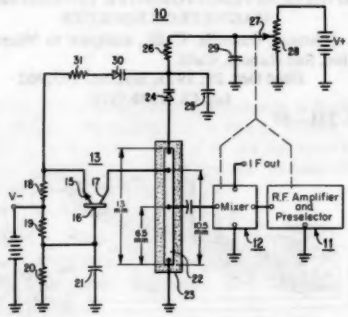
operated in a manner to maintain the oscillator signal output level substantially constant over a wide frequency range.

3,723,906

UHF OSCILLATOR

Arne R. Pedersen, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Feb. 26, 1971, Ser. No. 119,324
Int. Cl. H03b 5/18
U.S. Cl. 331—117 D **3 Claims**



A UHF transistor oscillator for a television tuner employs a voltage dependent variable capacitance (varactor) element in the feedback circuit coupled between the output and input circuits of the transistor. An adjustable control circuit, which connects the varactor to a source of D.C. potential, serves to vary the capacitance exhibited by varactor in the feedback circuit while simultaneously changing the reactive contribution of the varactor to the transistor input circuit.

3,723,907

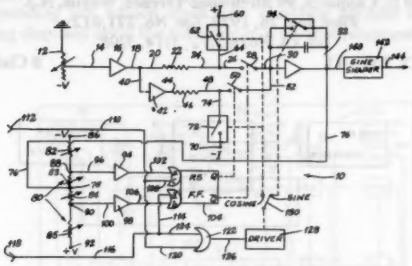
SYNC OSCILLATOR

Edwin J. Tajchman, Denver, and James D. Brandt, Lakewood, both of Colo., assignors to Computer Image Corporation, Denver, Colo.

Filed Aug. 24, 1970, Ser. No. 66,464
Int. Cl. H03k 3/02
U.S. Cl. 331—143 **11 Claims**

An oscillator for generating a triangular waveform by alternately switching positive and negative DC signals to the input of an integrator in response to output signals from a flip-

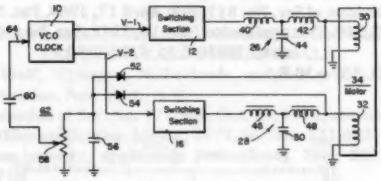
flop, the flip-flop being responsive to selective peak values of the integrator output, and means for synchronizing the oscillator to begin oscillating in response to a sync pulse in any one of several phases.



3,723,908
PHASE STABILIZED AC POWER SUPPLY FOR REACTIVE LOADS

Peter Laakmann, Los Angeles, Calif., assignor to Hugh Aircraft Company, Culver City, Calif.

Filed Sept. 2, 1971, Ser. No. 177,241
Int. Cl. H03b *3/04, 3/14*
U.S. Cl. 331—177 R **11 Claims**

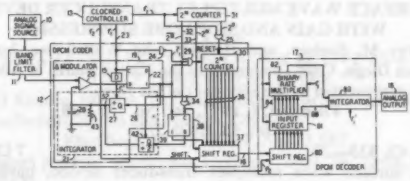


An AC power supply comprising a voltage controlled oscillator for synchronizing power switching sections which drive a load, such as a synchronous motor; a feedback circuit coupled between the load and the control input terminal of the voltage controlled oscillator adjusts the frequency thereof so as to cause a damping of oscillations caused by load variations.

3,723,909
DIFFERENTIAL PULSE CODE MODULATION SYSTEM EMPLOYING PERIODIC MODULATOR STEP MODIFICATION

Joseph Henry Condon, 190 Kent Place Blvd., Summit, N.J.

Filed June 21, 1971, Ser. No. 154,996
Int. Cl. H03k *13/22*
U.S. Cl. 331—11 D **19 Claims**

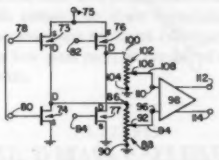


In a differential pulse code modulation system, the integration of a pulse train representing a delta modulation coded format of an analog signal is modified by injection of at least one current of a magnitude corresponding to a predetermined fractional delta modulation step and of a polarity which indicates whether or not a delta modulation pulse was present in a predetermined phase of each recurring differential pulse code modulation accumulating period of the system. In a system coder, the initiation of the injected signal also causes the addition of a corresponding least significant bit to the accumulator output transmitted to a decoder. That least significant bit is utilized in the decoder to produce a corresponding current for injection into the equivalent integrating system of the decoder.

3,723,910
MIXING CIRCUIT UTILIZING LINEAR RESISTANCES

James D. Cannon, Tucson, Ariz., assignor to Motorola Inc., Franklin Park, Ark.

Filed May 20, 1971, Ser. No. 145,256
Int. Cl. H03c *1/54*
U.S. Cl. 332—31 T **8 Claims**

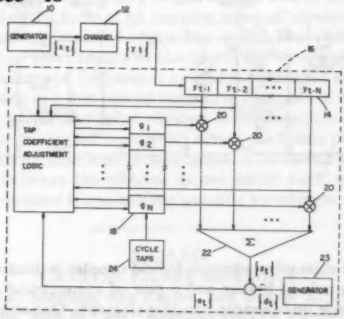


The mixing circuit employs the linear portions of the voltage-current characteristics of a plurality of field-effect transistors to amplitude modulate a first signal, having a first frequency, with a second signal having a second frequency thus providing an amplitude modulated signal. A differential amplifier is connected to the field-effect transistors and to the source of the first signal so that the common-mode rejection characteristic thereof is utilized to eliminate the undesired component at the first frequency from the amplitude modulated signal. As a result, virtually only the desired signal components having frequencies equal to the sum and difference of the first and second frequencies occur at the output of the amplifier.

3,723,911
TRAINING ADAPTIVE LINEAR FILTERS

George D. Forney, Jr., Lexington, Mass., assignor to Codex Corporation, Newton, Mass.

Filed Sept. 13, 1971, Ser. No. 179,653
Int. Cl. H04b *3/04*
U.S. Cl. 333—18 **5 Claims**

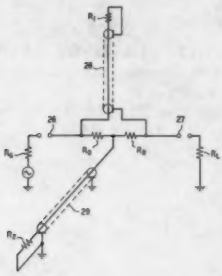


Adaptive linear transversal filter is trained with a periodic training sequence having period exactly equal to the number of variable parameters of the filter to be set in the training mode. After training, tap coefficients may be cycled in a closed loop to a preferred position.

3,723,912
CONSTANT RESISTANCE BRIDGED-T CIRCUIT USING TRANSMISSION LINE ELEMENTS

Raymond Allen Thatch, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed March 27, 1972, Ser. No. 238,178
Int. Cl. H03h 7/14
U.S. Cl. 333—20 7 Claims



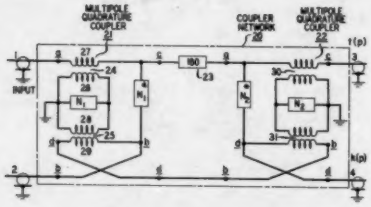
A wave-shaping network of the type in which a portion of the signal is delayed and subtracted from the signal is constructed in the constant resistance bridged-T form. Delay lines terminated in resistors form the bridging and shunting members. The result is a more accurate network that allows sharp frequency cutoff with significant noise improvement.

A triaxial structure in which the output shield of the above-ground delay line also serves as the inner conductor of a transmission line greatly reduces unwanted capacitance effects. A microstrip construction is also disclosed.

3,723,913
QUADRATURE HYBRID COUPLER USING ONE-PORT, LINEAR CIRCUIT ELEMENTS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1972, Ser. No. 257,874
Int. Cl. H01p 5/14; H03h 7/42
U.S. Cl. 333—11 13 Claims

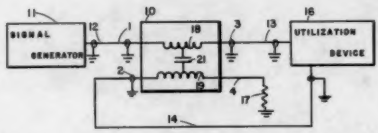


A new class of quadrature hybrid coupler is disclosed comprising a pair of baluns and a pair of symmetrical dual networks made up of simple, reactive elements. One conductor of each balun is connected in parallel with one of the networks and grounded at one end. The other network is connected between the other ends of the two other balun conductors. The four ends of the two other balun conductors constitute the four coupler ports. The two networks are fully defined to produce a quadrature coupler having an arbitrary power division character as a function of frequency.

3,723,914
LUMPED CONSTANT QUADRATURE COUPLER WITH IMPROVED PARASITIC SUPPRESSION

Joseph D. Cappucci, 99 Birchwood Terrace, Wayne, N.J.

Filed Jan. 26, 1972, Ser. No. 221,012
Int. Cl. H01p 5/12, 5/14, 3/08
U.S. Cl. 333—11 8 Claims

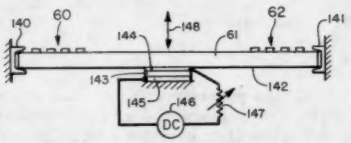


A lumped constant quadrature hybrid coupler having a wide band of directivity is disclosed. The coupler is constructed from lumped constant elements including a pair of closely magnetically coupled conductors with a lumped capacitor connecting them at a central portion. Each of the two respective ends of each of the pair of conductors serve as one of the four ports of the resulting coupler. Three printed circuit embodiments are disclosed which incorporate the teachings of this invention.

3,723,915
ACOUSTIC SURFACE WAVE DEVICE

Robert Adler, Northfield; Adrian J. DeVries, Elmhurst, both of Ill., and Fleming Dias, Palo Alto, Calif., assignors to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 817,093, April 17, 1969, Pat. No. 3,582,540. This application May 10, 1971, Ser. No. 141,911
Int. Cl. H03h 7/36, 9/00, 9/30
U.S. Cl. 333—30 R 1 Claim



A variable transmission apparatus for translating signals between a source and a load comprises a substrate propagative of acoustic surface waves. An input transducer coupled to a surface of the substrate and responsive to applied signals serves to launch acoustic waves. An output transducer is coupled to a portion of the surface spaced from the input transducer and, in response to the launched waves, derives output signals having a delay, relative to the input signals, that corresponds to the spacing between the transducers. Means are included for flexing the substrate to alter the surface wave phase velocity.

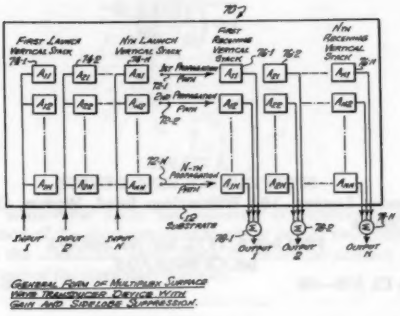
3,723,916
SURFACE WAVE MULTIPLEX TRANSDUCER DEVICE WITH GAIN AND SIDE LOBE SUPPRESSION

Jeffrey M. Speiser, and Harper John Whitehouse, both of San Diego, Calif., assignors to the United States of America as represented by the Secretary of the Navy

Filed Oct. 1, 1971, Ser. No. 185,628
Int. Cl. H03h 7/30
U.S. Cl. 333—30 7 Claims

A surface wave multiplex transducer device, having N propagation paths, comprising a substrate and N–*n* composite launch vertical stacks of transducers, where N 3 and O *n* N − 1, each stack consisting of N transducers whose inputs are connected together, disposed upon the substrate in a parallel relationship and capable of transmitting N parallel

surface waves across the substrate. Included are N-n composite receiving vertical stacks of transducers, each stack consisting of N transducers whose outputs are connected together, the j-th receiving stack being identical to the corresponding j-th launch stack, the receiving vertical stacks being disposed upon the substrate in a parallel relationship to



GENERAL FORM OF MULTIPLEX SURFACE WAVE TRANSDUCER DEVICE WITH GAIN AND SIDELOBE SUPPRESSION

the launch vertical stacks of transducers, so as to receive the N parallel launched surface waves. The (N-n)N launch and the (N-n)N receiving stacks of transducers are so coded that the response of the j-th receiving stack to an impulse applied to the k-th launch stack is an impulse if the numbers j and k are equal and zero if j and k are unequal.

3,723,917

CIRCUIT ARRANGEMENT FOR RECEIVING HIGH-FREQUENCY ELECTRIC SIGNALS

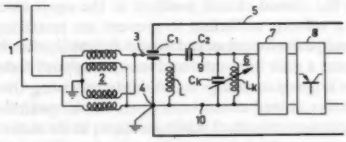
Gerrit Wolf, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 771,549, Oct. 29, 1972, abandoned. This application April 5, 1971, Ser. No. 131,483

Claims priority, application Netherlands, Nov. 25, 1967, 6716071

Int. Cl. H03h *7/38*

U.S. Cl. 333—32 **7 Claims**



A circuit which steps up a substantially pure antenna resistance to a high value which is constant across a wide frequency band. The circuit features a parallel resonant circuit coupled to the antenna and fixed tuned to a frequency at one of the band limits. A series reactance couples the fixed tuned circuit to a circuit which is tunable across the band and is the input of an R.F. amplifier.

3,723,918

SEPARATING FILTER NETWORK ACTIVE AS A QUARTZ BAND-STOP FILTER

Heinz Krause, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

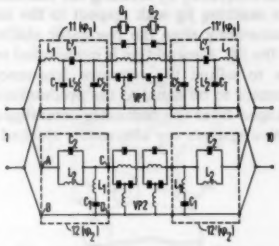
Filed Sept. 18, 1970, Ser. No. 73,547

Claims priority, application Germany, Sept. 26, 1969, P 19 48 802.9

Int. Cl. H03h *7/14, 9/00*

U.S. Cl. 333—72 **5 Claims**

A network consisting of an all-pass circuit which consists of two equal frequency separating networks whose partial filters have even characteristic functions reciprocal to one another of the degree $2n$ (n=1, 2, 3 . . .) and in which between each two equal partial filters there are connected four-pole circuits which are dimensioned in such a way that the electrical properties of the entire network, except for one additional phase,



agree with the prescribed electrical properties of the interposed four-pole circuits. The interposed four-pole circuits are constructed with respect to their transmission properties as equal all-pass or low-pass sections of which the one lying in the band-pass or low-pass path, is rendered a band stop circuit by quartz elements.

3,723,919

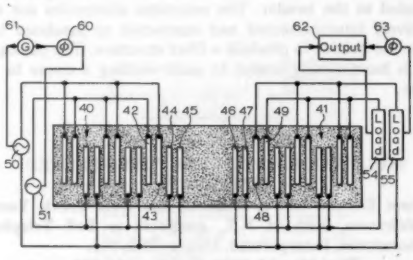
ACOUSTIC SURFACE WAVE FILTERS WITH REFLECTION SUPPRESSION

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed March 20, 1972, Ser. No. 235,990

Int. Cl. H03h *9/20, 9/30*

U.S. Cl. 333—72 **4 Claims**



A surface-wave integratable filter includes an input transducer for launching acoustic surface waves along a path in a propagating medium. An output transducer responds to those surface waves by developing output signals. One or both transducers takes the form of an iterative series of conductive ribbons disposed laterally across the path. The ribbons are spaced apart by a distance of one-fourth the wavelength of the acoustic energy. A first source or load is connected exclusively across one of a first pair of successive ribbons and one of an adjacent pair of successive ribbons. A second source or load similarly is connected exclusively across the others of the ribbons in those first and second pairs. The center-to-center distance between the ribbons across which each source or load is connected is one-half the acoustic wavelength.

3,723,920

CRYSTAL FILTER ASSEMBLY

Desmond F. Sheahan, San Carlos, and George C. Callander, Palo Alto, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

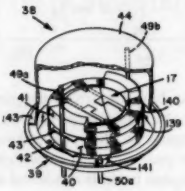
Filed June 24, 1971, Ser. No. 156,275

Int. Cl. H03h *7/10, 9/00*

U.S. Cl. 333—72 **17 Claims**

In this filter, each one of two coupled resonators is formed on a different crystal wafer. Each wafer is accurately posi-

tioned with respect to one longitudinal groove in the periphery of a ceramic ring. The wafer is supported in the central opening in the ring with wires which are soldered to metalized areas of the ring and to resonator lead patterns on the wafer to form a resonator assembly. Each resonator is tuned to operate at a predetermined frequency by locating the associated resonator assembly in a masking jig with respect to the one groove on the ring to accurately align the resonator electrode patterns with holes in the jig. A metal film is evaporated onto a resonator electrode to adjust the resonant frequency of the associated resonator to be equal to the predetermined frequency. In a packaged filter the resonator assemblies and electrically conductive spacers are alternately stacked on a header



having a pair of posts protruding therefrom that are located in longitudinal grooves in the ceramic rings and openings in the spacers for supporting the stacked elements. Extensions and tabs on the spacers are soldered to the alignment posts and metalized areas on the rings, respectively, to ground the resonators and spacers to the header. The spacer sandwiched between the rings provides isolation between the resonators on adjacent wafers. A discrete chip capacitor is connected to a resonator electrode and a metalized area on a ring which is grounded to the header. The resonator electrodes are also selectively interconnected and connected to insulated lead pins in the header to produce a filter structure. The packaged filter is hermetically sealed by cold welding a cover to the header.

3,723,921

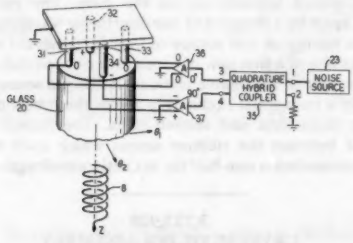
MULTIMODE WAVEGUIDE WITH REDUCED DISPERSION

Harrison Edward Rowe, Rumson, and Dale Travis Young, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 14, 1971, Ser. No. 143,521

Int. Cl. H01p *3/12, 1/16;* G02b *5/14*

U.S. Cl. 333—95 R **4 Claims**



Transmission performance of a multimode waveguide is optimized (i.e., pulse dispersion is minimized) by optimizing the coupling among the different modes. More specifically, in a waveguide supportive of modes having group velocities v_1 and v_2, and wherein the coupling mechanism comprises random discontinuities having an essentially white spectrum, optimum coupling is defined by an optimum coupling length L_{opt} given by

$$L_{opt} = k \cdot f,$$

where f is the midband signal frequency and

k is a constant equal to

$$\frac{1}{\pi f^2 \left(\frac{1}{v_2} - \frac{1}{v_1}\right)}$$

3,723,922

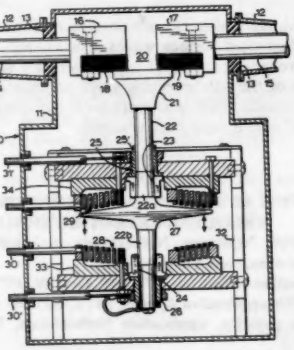
SPLIT HUB LOCKING DEVICE

Theodor Loewen, 102 Willowridge Road, Weston, Ontario, Canada

Filed July 6, 1972, Ser. No. 269,472

Int. Cl. H01h *3/28*

U.S. Cl. 335—68 **6 Claims**



A vacuum circuit breaker includes separable contact structure including a contact movable from a closed circuit position to an open circuit position; a motor for moving the contact from the closed circuit position to the open circuit position with a velocity sufficient to prevent arc restriking after a current zero; a shaft connected to and movable with the movable contact; a pair of inner and outer support hubs having respective aligned openings for slidably receiving the shaft in the respective closed circuit and open circuit positions of the movable contact; the shaft having a taper at its outer end and the outer support hub having a taper of smaller taper angle whereby the shaft is wedged into the opening of the outer hub as it approaches the open circuit position so that kinetic energy of the shaft is frictionally dissipated and the shaft comes to rest in the open circuit position of the movable contact; the outer support hub being constructed as a split sleeve, each sleeve section providing an axially extending cantilever spring adapted to engage the shaft taper frictionally.

3,723,923

RELAY SWITCH

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki-Kaisha Tokai rika Denki Seisakusho, Aichi-ken, Japan

Filed Dec. 15, 1971, Ser. No. 208,158

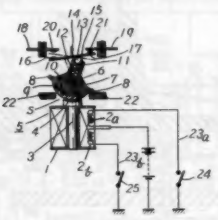
Claims priority, application Japan, Dec. 21, 1970, 45/128780; Dec. 21, 1970, 45/128781

Int. Cl. H01h *51/27*

U.S. Cl. 335—81 **3 Claims**

A relay switch comprising an electromagnet, which can shift the contact of a movable conductor plate or switch arm from engagement with one stationary contact to another stationary

contact and can maintain the electrical contact of the conductor plate with the selected stationary contact even after the deenergization of the electromagnet, the movement of said conductor plate being controlled by an actuating member



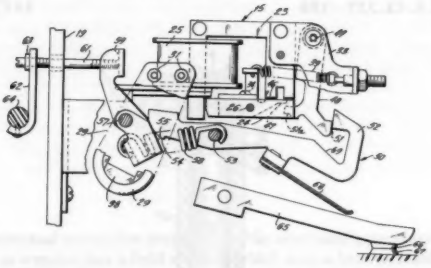
which is movable under the influence of momentary magnetization of the electromagnet to either one of two positions where the conductor plate keeps its electrical contact with either one of the stationary contacts.

3,723,924

SHUNT TRIP AND UNDERVOLTAGE DEVICE

Howard R. Shaffer, Glenside, Pa., and Albert Strobel, Cherry Hill, N.J., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 4, 1971, Ser. No. 186,346
Int. Cl. H01h 9/20
U.S. Cl. 335—169 **9 Claims**



Undervoltage and shunt trip units for a multi-phase molded case circuit breaker are each constructed with a primary latch operated by the armature of an electromagnet. The primary latch acts through a secondary latch to hold an intermediate member in latched position, wherein the latter holds an actuator in its inactive position. When the latches are released to release the intermediate member, a coiled tension spring acting directly upon the actuator moves the latter to a tripping position to trip the contact latching mechanism of the circuit breaker. Another spring, separate from the actuator operating spring, biases the magnet armature away from the magnet yoke so that adjustment of the armature spring will not alter the force with which the actuator is moved to its tripping position.

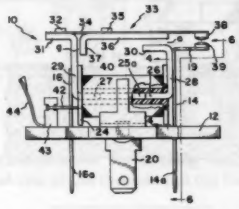
3,723,925

ELECTROMAGNETIC RELAY

Ralph W. Alten, East Detroit, Mich., assignor to Essex International Inc., Fort Wayne, Ind.

Filed May 30, 1972, Ser. No. 257,586
Int. Cl. H01h 45/00
U.S. Cl. 335—187 **12 Claims**

An electromagnetic relay comprises an energizable and deenergizable magnetically associated relay coil within which is mounted a pair of magnetic, electrically isolated, core parts connected in a relay controlled circuit, a terminal mounted on one core part and connected in the controlled circuit, and an armature mounted at one end on the other core part and carrying an electrical contact at its other end which is movable into engagement with the terminal to provide a current path between the armature and the terminal in response to the



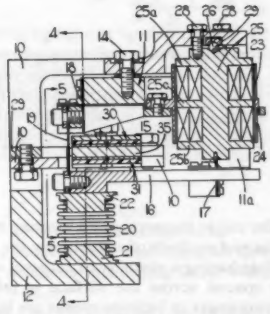
energization of the coil. The armature also is movable into and out of engagement with the one core part to provide between the armature and terminal a second current path parallel with the first current path to minimize heating.

3,723,926

FLUID PRESSURE TRANSDUCERS

Alan Thomas, Stratford-on-Avon, and Ronald Alfred Heath, Harborne, Birmingham, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed March 22, 1972, Ser. No. 237,023
Claims priority, application Great Britain, March 26, 1971, 8,216/71
Int. Cl. H01f 7/08
U.S. Cl. 335—268 **5 Claims**



An electromagnetic force applying device includes a core with two recesses each having two windings therein, the two windings in one recess being wound in the same sense and the two windings in the other recess being wound in opposite senses. A tubular armature surrounds the core and windings and is displaced acially of the core when current is passed through both windings.

3,723,927

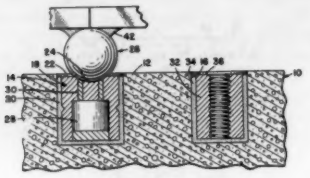
MAGNETIC HOLDING MEANS IN A SURFACE PLATE DIMENSIONAL MEASURING APPARATUS

Alexander G. Blakey; Jack S. Adams, and James J. Swarts, all of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 821,587, May 5, 1969, abandoned. This application April 6, 1970, Ser. No. 25,713
Int. Cl. H01f 7/20
U.S. Cl. 335—285 **6 Claims**

The apparatus utilizes a surface plate with special inserts imbedded in its surface in a geometric pattern and associated fixtures and inspection tools for the purpose of dimensionally

measuring specimen parts. The inserts are permanent or electromagnetic and have a recess in the exposed surface of the insert. The recess shape may be spherical, conical, or other geometric shape. Fixtures and inspection tools have matching



protuberances of the same geometric shape in a mating precision pattern under their bases, and are precisely located on the surface plate when the protuberances are aligned with the recesses in the magnetic inserts.

3,723,928

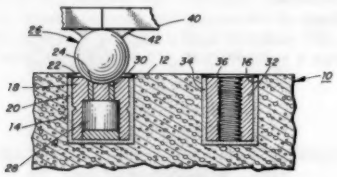
MAGNETICALLY HELD MEASURING AND LOCATING FIXTURES

Alexander G. Blakey; Jack S. Adams, and James J. Swarts, all of San Diego, Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 821,587, May 5, 1969, abandoned. This application March 19, 1971, Ser. No. 126,021

Int. Cl. H01f *7/20*

U.S. Cl. 335—285 **19 Claims**



Fixtures for use in measuring and locating systems utilizing surface plates and methods of assemblying the fixtures are disclosed. A plate having a plurality of recesses of uniform sizes and shapes spaced across the surface is provided. Fixture bodies carrying gages or locating means are bonded to one or more support members which are shaped to seat in the recesses. The fixtures may be easily removed and replaced, with the recesses providing precise realignment. Preferred recess members and support members are also described in detail.

3,723,929

BIMETALLIC CIRCUIT OVERLOAD PROTECTOR

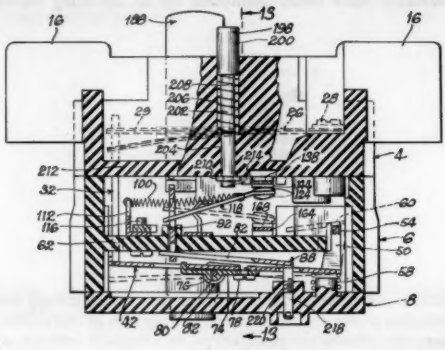
Clement P. Sitar, Addison, Ill., assignor to Furnas Electric Company, Batavia, Ill.

Filed April 7, 1972, Ser. No. 242,091

Int. Cl. H01h *71/16*

U.S. Cl. 337—38 **25 Claims**

A thermal overload protector for electrical circuits usable in single and multiphase circuits. A bimetallic element actuates a snap action switch in response to excess current in a heater connected in the circuit. An adjusting cam engages a switch element to permit adjustment of the operating value over a range while a reset cam can be actuated to provide for manual or automatic reset. Part of the switch operating linkage can be formed from a bimetal to provide an ambient compensating element. Also included are screws acting on the actuating linkage to permit precise adjustment during manufacture to compensate for such manufacturing tolerances as may



exist. The protector may be constructed in either a normally closed or a transfer contact configuration.

3,723,930

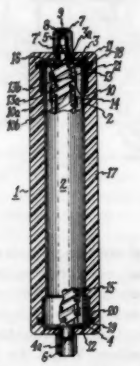
OIL IMMERSIBLE CURRENT LIMITING FUSE ASSEMBLY

Robert E. Koch, Pittsfield, Mass., assignor to General Electric Company, New York, N.Y.

Filed Feb. 10, 1972, Ser. No. 225,232

Int. Cl. H01h *85/02*

U.S. Cl. 337—158 **14 Claims**



An oil immersible current limiting fuse assembly is provided by encapsulating a current limiting fuse in a homogeneous, molded epoxy material and providing resilient seal means adjacent the axial ends of the assembly, between the epoxy encapsulation and the fuse. The fuse assembly is further characterized by incorporating a vent passageway through one of the fuse terminals, which is effective to vent gas from the interior of the fuse during its manufacture in order to assure the maintenance of a fluid-tight sealing relationship between the fuse and the encapsulating epoxy.

3,723,931

PROTECTORS FOR ELECTRIC CIRCUITS

Angelo Urani, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

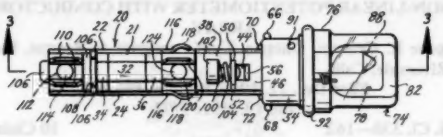
Filed July 19, 1971, Ser. No. 163,889

Int. Cl. H01h *37/74*

U.S. Cl. 337—342 **13 Claims**

A fuse carrier has a circuit-closing member that can be moved by the switch-actuating plunger of a fuse which is held

by clips on that fuse carrier. A stop on that fuse carrier lies in the path of a protuberance on one terminal of that fuse, and thereby maintains a minimum distance between that terminal and that circuit-closing member. That stop also coacts with an abutment, within an elongated recess in the fuseholder for that fuse carrier, to keep that fuse carrier from being inserted into



that recess while it is in its inverted position. A surface adjacent one of the clips and an open area adjacent the other of the clips on the fuse carrier coact with the protuberance on the one terminal of the fuse to keep that fuse from being fully seated within those clips unless that fuse is correctly oriented relative to the circuit-closing member.

3,723,932

THERMAL PROTECTIVE ASSEMBLY

Homer R. Miller, Rochester, and Giacinto Vallone, Brockport, both of N.Y., assignors to General Electric Company, Bridgeport, Conn.

Filed Feb. 1, 1971, Ser. No. 111,459

Int. Cl. H01h *37/32*

U.S. Cl. 337—405 **5 Claims**

A thermal protective assembly for an electrical component such as a motor has a field winding which uses a heat meltable alloy formed into a bent shape and connected in series with and resting on the field. The alloy receives conductive heat from the windings and is designed to melt before the I^2R heating from a malfunction breaks the circuit. The bent form of the alloy is chosen to create an open circuit and ensure no puddling to bridge the opening on melting of the alloy. Additional means is provided to insulate the alloy from the field windings and to cover it from the ambient whereby it responds only to conductive heat.

3,723,933

TRIBO-ELECTRICAL TRANSDUCER FOR MONITORING THE MOVEMENT OF THREAD-LIKE STRUCTURES

Erich Loepfe, Zollikerberg; Walter Keller, Kempten, and Karl Zweifel, Grut, all of Switzerland, assignors to Aktiengesellschaft Gebruder Loepfe, Wetzikon, Switzerland

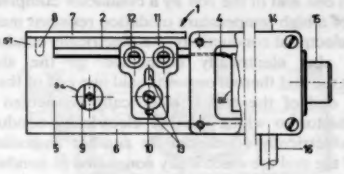
Filed Sept. 30, 1971, Ser. No. 185,212

Claims priority, application Switzerland, April 29, 1971, 6321/71

Int. Cl. G01l *1/22*

U.S. Cl. 338—2 **14 Claims**

A tribo-electric transducer for monitoring the movement of thread-like structures, comprising a friction body against which bear the traveling threads, at least one electrode body arranged at the friction body and a housing consisting of an electrically conductive material serving as the screening for the friction body and the electrode body. The invention contemplates the provision of guide means for simultaneously guiding a number of threads over the friction body, and means for changing the spacing between the friction body and other



parts of the transducer or for altering the contact pressure between at least one of the threads and the friction body.

3,723,934

PHOTOSENSITIVE TRANSDUCER

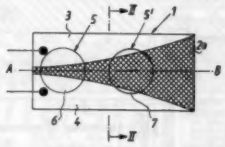
Alfred Kubitzek, 8022 Grunwald, and Kurt Borowski, 8 Munich 90, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed March 23, 1971, Ser. No. 127,238

Claims priority, application Germany, March 26, 1970, P 20 14 871.4

Int. Cl. H01c *7/08*

U.S. Cl. 338—15 **6 Claims**



A photosensitive transducer for determining the orientation of light beams having a predetermined diameter has a straight row of transducer portions of identical size but of different sensitivity. Such transducer portions may include differently dimensioned parts of a trumpet-shaped photoconductive layer, or identically dimensioned parts of a photoconductive layer overlapped by filters of different light transmissivity.

3,723,935

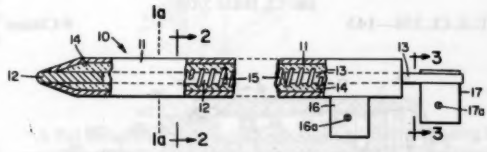
TEMPERATURE SENSOR

John F. Frazier, Painted Post, and Garo M. Ziver, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 17, 1972, Ser. No. 227,095

Int. Cl. H01c *7/02*

U.S. Cl. 338—28 **10 Claims**



A temperature sensor comprising a coil of wire of a high temperature resistant material having a relatively high temperature coefficient of electrical resistance; and a hollow sheath of a high temperature oxidation resistant material having high thermal conductivity, and at least one flat outer side for improved thermal transfer when such flat side is disposed against or in physical contact with a surface of a plate or sheet of a vitreous material providing a cooking surface. The sheath surrounds the coil with a space provided between the sheath

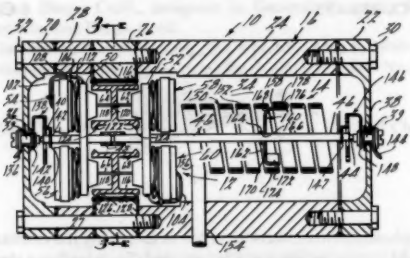
and coil, and a compacted powder of an electrical insulating material having a relatively high thermal conductivity surrounds the coil. In one embodiment, the sheath is electrically connected to one end of the coil by a conductor comprising a rod or wire of a high temperature oxidation resistant material having high electrical conductivity. An electrically conductive terminal is also electrically connected to the sheath, preferably at the end thereof opposite said one end of the coil. The second end of the coil is electrically connected to a similar conductor to which another electrically conductive terminal is electrically connected. In another embodiment, both ends of the coil are electrically connected to conductors which extend through the ends of the sheath and are provided with terminals for electrical connections to be made to the coil. In such embodiment no electrical connections are made to the sheath.

3,723,936

MICRO-TORQUE POTENTIOMETER

Herbert J. Zurstadt, Grosse Pointe Park, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed March 2, 1970, Ser. No. 15,503
Int. Cl. H01c 13/00, 15/00
U.S. Cl. 338—40 **15 Claims**



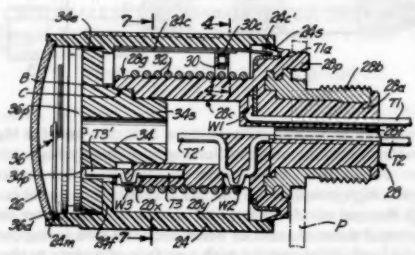
A potentiometer requiring extremely low torque input for the operation thereof preferably having a contact roller of magnetic material engaging an elongated resistive element, a taut-band suspension for the contact roller, and a magnet establishing a magnetic field resulting in an engagement force between the contact roller and the resistive element. The potentiometer of this invention is particularly suitable for use as an electrical output for a multi-convolution Bourdon tube.

3,723,937

PRECISION POTENTIOMETER WITH INDICATOR

Sydney W. Frey, Jr., Upland; Donald L. Gaa, and Robert W. Tetamore, both of Riverside, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Oct. 26, 1971, Ser. No. 192,119
Int. Cl. H01c 5/00
U.S. Cl. 338—143 **9 Claims**



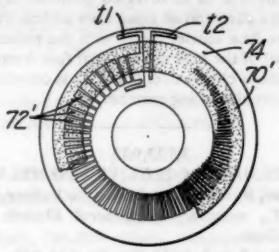
A simplified rotary precision potentiometer of improved accuracy with indicator for indicating the setting of the movable contact, the indicator not requiring setting or phasing with the contact after assembly, and the indicator accurately indicating the low (zero), maximum (high) and intermediate settings, and with the resistance element an exact multiple of 360 degrees between its electrical ends.

3,723,938

NON-LINEAR POTENTIOMETER WITH CONDUCTOR ARRAY

Eugene R. Gramm, Ontario, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Dec. 22, 1969, Ser. No. 886,807
Int. Cl. H01c 9/02
U.S. Cl. 338—162 **10 Claims**



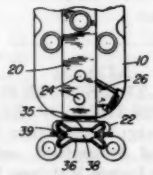
A potentiometer for accurately varying the electrical resistance exhibited between two terminals thereof as a specified non-linear mathematical function of the unit-by-unit extent of movement of a movable contact along an elongate resistance element which overlies an array of discrete conductor members whose areal extent and areal disposition under and in bridging contact with the film are such that the specific mathematical function is simulated in variation of the exhibited resistance. In circular-track elements, representative functional relationships include 90° sine, 180° sine, 360° sine, 20db log, single-sided square, and double-sided square.

3,723,939

GROUNDING MEANS FOR MOUNTING BRIDGES OF ATTACHMENT PLUG RECEPTACLES AND THE LIKE

Harold E. Schleicher, West Hartford, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Continuation of Ser. No. 100,014, Dec. 21, 1970, abandoned.
This application Oct. 26, 1971, Ser. No. 192,595
Int. Cl. H01v 3/06
U.S. Cl. 339—141 R **8 Claims**

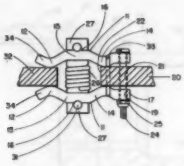


An electric wiring device having a metal supporting member for mounting the device in an electrically grounded box. A resilient connecting member stamped from thin sheet metal into a generally elongated shape with a central elongated opening emerging at its ends into lobe-shaped openings, providing opposite arms stretching from one end of the connecting member to the other in position to resiliently engage opposite sides of a screw bolt inserted through said central opening for securing said connecting member to the grounded box, and means securing and electrically connecting the connecting member to the supporting member.

3,723,940
ELECTRICAL CONTACT ASSEMBLY

James H. Leonard, Cedar Rapids, Iowa, assignor to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 58,906, July 28, 1970, abandoned.
This application Nov. 18, 1971, Ser. No. 200,249
Int. Cl. H01r *13/62*
U.S. Cl. 339—64 M 9 Claims

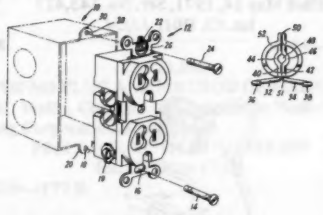


The assembly comprises a plurality of aligned pairs of spaced apart contact fingers directly attached at one end on opposite sides of a conductive bar without the use of intermediate connectors or alignment frames. The contact fingers of adjacent pairs are biased toward each other intermediate of their ends by a tension spring disposed between the pairs and secured to a pair of connecting links each having outwardly extending pins overlying the outer surfaces of adjacent fingers. The free ends of the contact fingers are convex toward each other and the convex portions of each pair of contact fingers are arranged to grip directly on opposite sides of a second conductive bar.

3,723,941
MOUNTABLE SPRING WIRE GROUNDING CLIP

Walter C. Schumacher, 45 Ramblewood Dr., Warwick, and Robert C. Cressman, 34 Tanglewood Dr., East Greenwich, both of R.I.

Filed May 24, 1971, Ser. No. 146,136
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R 1 Claim



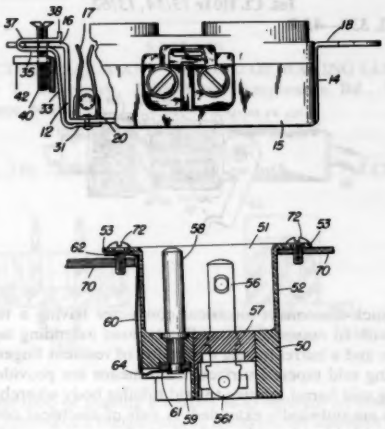
Grounding connection between the mounting strap of a wiring device and the metal housing in which the device is mounted by the strap is achieved by means of a spring clip designed for use with the mounting strap to ensure continuity of electrical connection between the strap and metal housing.

3,723,942
GROUNDING CLIP ELECTRIC RECEPTACLES

John J. Dennison, Southington, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 135,034, April 19, 1971, abandoned. This application March 3, 1972, Ser. No. 231,565
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R 14 Claims

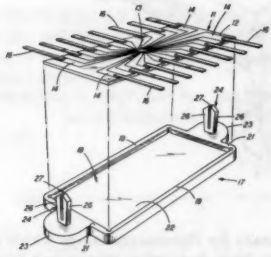
A bent leaf-spring type clip member is secured to the mounting bridge or the grounded contact terminal of an electric receptacle or connector and bent up around one end of the bridge or body of the device in position to press constantly against the shank of the mounting screw as it passes through an aperture in the plaster ear portion of the bridge member or mounting flange of the device and through an aperture in the clip. The screw threads into the usual lug on the outlet or wall box or mounting plate to secure the device in position.



3,723,943
METHODS OF SECURING FLAT INTEGRATED CIRCUITS TO PRINTED WIRING BOARDS AND A SUPPORT DEVICE THEREFOR

Robert E. Hotze, Westerville, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 10, 1971, Ser. No. 114,197
Int. Cl. H01r *13/54*; H05k *1/02*
U.S. Cl. 339—17 CF 12 Claims

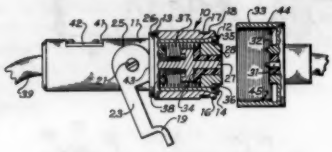


A flat integrated circuit package, having leads extending in cantilever from the edge of a substrate, is held in engagement with a printed wiring board by a support device which is temporarily attached to the board. The board is passed adjacent to a wave-soldering device to facilitate the soldering of areas where the ends of the cantilevered leads are pressed by the support device into overlapping engagement with land areas of printed wiring on the board. The support device supports the package in such a manner that the integrated circuit is protected and shielded from molten solder and heat emanating therefrom during the period when the board is passed adjacent to the soldering device.

3,723,944
QUICK-DISCONNECT ELECTRICAL CONNECTOR

Richard H. Gauchat, and Nathan W. Sabel, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 5, 1971, Ser. No. 121,423
Int. Cl. H01r *13/54, 13/62*
U.S. Cl. 339—45 R 1 Claim

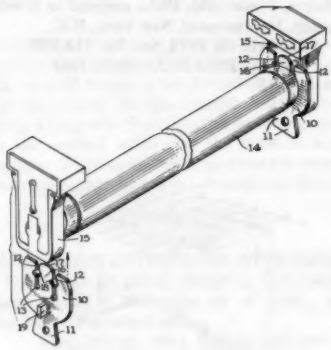


A quick-disconnect electrical connector having a tubular body with an outwardly extending tapered extending tapered surface and a barrel having a plurality of resilient fingers surrounding said tapered surface. Cam means are provided for moving said barrel relative to said tubular body whereby said fingers are outwardly extended. A pair of electrical contacts are provided inside said tubular body for engaging with contacts in a mating connector.

3,723,945
LOCKING MEANS FOR FLUORESCENT LAMPS

Lewis Detch, 2133 Chalfant Street, Pittsburgh, Pa.

Filed April 3, 1972, Ser. No. 240,519
Int. Cl. H01r *33/10*
U.S. Cl. 339—54 9 Claims

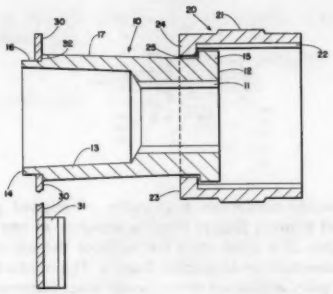


A locking means for fluorescent lamps which will serve to prevent a lamp from becoming disengaged from the lamp holder in the presence of vibration or shock, such locking means being in the form of a relatively thin wafer-like member for insertion between the lamp end and the adjacent surface of the lamp holder and having open-ended slot means which terminate inwardly of the member in apertures for locking engagement with the bi-pins of the lamp upon insertion of the member into locking position with respect thereto, and the edge walls of said slot means having, intermediate the open ends thereof and said apertures, depressions or notches into which the said bi-pins may snap during their passage through said slot means upon either insertion or withdrawal of the member, thereby to apprise the user of the position of the member as to its seated (locking) or unseated (freeing) position with respect to the said bi-pins.

3,723,946
CABLE CONNECTOR

William Paul Weatherup, and Francis Robert Campbell, both of Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada

Filed Oct. 18, 1971, Ser. No. 189,909
Int. Cl. H01r *13/54*; F16b *37/00*; F16l *19/02*
U.S. Cl. 339—89 R 1 Claim



A connector for threaded engagement with a cable — particularly a coaxial cable — has a captive nut which is moved axially on the connector and becomes frictionally or otherwise into engagement with the outer surface of the connector. The nut can then be used to screw the connector onto the cable. A typical example is for the connector to have a tapered outer surface and the nut is jammed onto the taper by axial movement. After screwing on the connector the nut is freed by a small axial movement.

3,723,947
ELECTRIC ACCESSORY CONNECTOR FOR CAP LAMP BATTERY

Homer A. Lozeau, Worcester, Mass., assignor to Koehler Manufacturing Company, Marlboro, Mass.

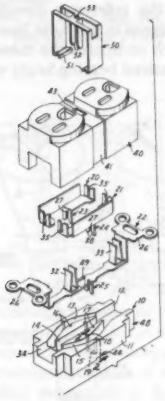
Filed May 14, 1971, Ser. No. 143,417
Int. Cl. H01r *13/54*
U.S. Cl. 339—91 R 8 Claims

Electric connector means for a miner's cap lamp battery includes a plug receptacle component supported on the battery and connected to the positive and negative electrodes of the battery. A plug component is slidably engageable with the receptacle and includes positive and negative contacts for contacting recessed contacts in the receptacle. The negative contact of the receptacle is internally housed in a concealed position to be engaged by a negative contact of the accessory plug only when the plug is in a fully advanced position. A trap plate and spring arrangement protects the negative contact from tampering by an object inserted through the slideway of the plug contact.

3,723,948
ELECTRICAL COMPONENT

Gerald A. Wyatt, Shoreview, and Gail A. Anderson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 73,414, Sept. 18, 1970, abandoned. This application Nov. 8, 1971, Ser. No. 196,290
Int. Cl. H01r 9/08
U.S. Cl. 339—99 R **7 Claims**

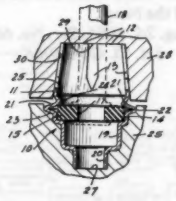


An electrical connector or circuit component capable of being rapidly attached to insulated wires and having a base member channeled to receive mutually electrically insulated wire conductors, e.g., insulated copper wires carried in a nonmetallic sheath, such as used to carry current in machines or buildings, conductive contact elements capable of being forcefully applied to wire conductors to make electrical contact without preliminary stripping of the insulation or severing of the wire conductor, an insulating body member retaining the elements and including parts thereon characterizing the circuit component, and holding means to hold together the base and body.

3,723,949
PHONO PLUG AND METHOD OF MAKING

William H. Wallo, Chicago, Ill., assignor to Wall-Able Manufacturing Corporation, Chicago, Ill.

Filed July 2, 1971, Ser. No. 159,269
Int. Cl. H01r 17/06
U.S. Cl. 339—177 R **11 Claims**



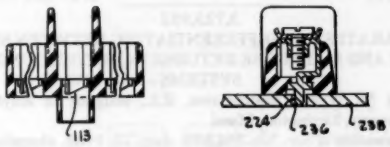
A pin-carrying washer is seated on a shoulder facing toward the mouth end within and intermediate the length of the plug shell and is locked in place by a clamping shoulder crimped radially inwardly in the shell spaced from the seating shoulder. An annular radially outwardly projecting rib between the seating and clamping shoulders reinforces the shell and serves as a finger grip.

A method of making the phono plug comprises initially constructing the shell outwardly from the seating shoulder of a diameter slightly larger than the diameter of the washer, inserting the washer through the mouth end of the shell onto the seating shoulder, retaining the shell about the seating shoulder and therebelow against deformation, and collapsing material of the shell wall radially inwardly to provide the clamping shoulder, as by applying axial force to the shell wall toward the seating shoulder.

3,723,950
JUNCTION BLOCK AND METHOD OF MAKING SAME

Rodger T. Lovrenich, 2285 West Temperance Rd., Temperance, Mich.

Filed Jan. 6, 1971, Ser. No. 104,435
Int. Cl. H01r 9/00
U.S. Cl. 339—198 R **2 Claims**



The method of making a barrier strip wherein an insulator body is formed of a thermo plastic material, the insulator body having a stressing wall therein; and an electrically conductive metal conductor clip is formed with a resilient pre-stressing section; assembling the conductor clip with the insulator body in such fashion that the clip pre-stressing section is placed under a distorting force by engaging it with the stressing wall of the insulator body; heating the assembly to place the insulator body in a pliable state so that the stored force in the pre-stressing section of the conductor clip is relieved by the movement of the clip into the pliable plastic body; and cooling the assembly to provide a close mechanical interlock between the insulator body and the conductor clip. A novel barrier strip assembly results from the above method.

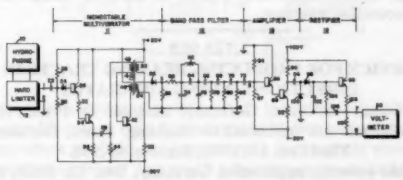
ERRATUM

For Class 340—347 DD see:
Patent No. 3,722,107

3,723,951
ACOUSTICAL DETECTOR CIRCUIT

Louis J. Kush, Jr., and Walter L. Baker, both of State College, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 5, 1963, Ser. No. 286,149
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R **2 Claims**



2. An apparatus for use in underwater active-acoustic echo-ranging systems to provide a measure of the variable ratio of self-noise to reverberation signals during listening intervals between successive search-pulse transmission instants, said apparatus comprising, in combination:

hydrophone means for reception of target-echo signals in a background of reverberation and self-noise signals;

a limiter circuit for conversion of said signals to a rectangu-

lar-waveform signal having the same zero-axis crossing characteristics as the signal received by said hydrophone means;

multi-vibrator means adapted to provide, in response to triggering action of said rectangular-waveform signal whenever it changes polarity in preselected sense, a train of short pulses of fixed duration and amplitude;

said train of pulses presenting a frequency-variational characteristic evidenced by an A.C. ripple signal which in a predetermined frequency band is of magnitude increasing with self-noise/reverberation signal ratio;

means including a band-pass filter for passing only said predetermined frequency band of A.C. ripple signal; and

means responsive to said A.C. ripple signal in said predetermined frequency band to provide a measure of said self-noise/reverberation signal ratio.

3,723,952

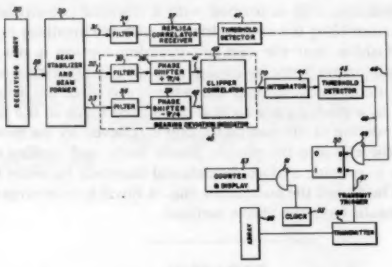
APPARATUS FOR DIFFERENTIATING BETWEEN SIDE LOBE AND MAIN LOBE RETURNS IN DEPTH SOUNDING SYSTEMS

George M. Walsh, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 754,659, Aug. 22, 1968, abandoned. This application May 26, 1970, Ser. No. 41,700

Int. Cl. G01s 9/68

U.S. Cl. 340—3 R **9 Claims**



The apparatus includes means for acoustically illuminating the ocean bottom, and a receiving arrangement. The receiving arrangement comprises means for extracting an acoustic echo signal out of noise, and means for generating a signal magnitude proportional to the phase difference between echo signal arrivals at two spatially separated points. A logic arrangement gates through extracted echo signals when the phase difference signal magnitude is less than a predetermined quantity. This permits identification of the received echo returns in term of their angle of arrival. Consequently, all side lobe returns may be excluded. The apparatus further comprises means for measuring the time of arrival of gated through extracted acoustic signals in order to complete the depth sounding function.

3,723,953

DEVICE FOR PRODUCING BEARING TRACES IN DIRECTION FINDING APPARATUS

Kurt Scheer, Bremen, Germany, assignor to Fried. Kupp Gesellschaft mit beschrankter Haftung, Essen, Germany

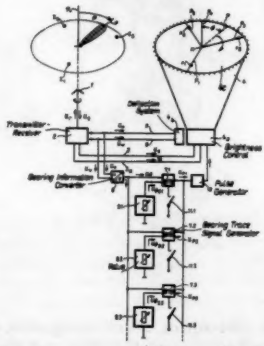
Filed Dec. 14, 1970, Ser. No. 97,998

Claims priority, application Germany, Dec. 12, 1969, P 19 62 336.0

Int. Cl. G01s 9/66, 3/00

U.S. Cl. 340—3 R **8 Claims**

An improved apparatus for producing one or a plurality of bearing traces associated with arbitrarily selectable directions in a panoramic display on the screen of a cathode-ray tube indicator for a direction finding system operating according to the reflected beam method (radar or sonar devices) with synchronous rotation of the direction of the radar or sonar beams (bearing direction) and the direction of deflection of the cathode-ray beam through the aid of bearing direction signals, including a reference direction, e.g., forward, signal and angle of rotation signal in the form of an alternating voltage signal, contained in a bearing information channel transmitting these signals from the transmitter-receiver of the system to the deflection system of the cathode-ray tube. The desired bearing traces are produced by feeding the bearing direction signals to a digital or analog integrating means which converts the angle of rotation signal into a measured bearing angle value which corresponds to the momentary angle of rotation, relative to the reference direction. The measured bearing angle value signal is fed to at least one bearing trace signal generator which compares the measured bearing angle value with a preset desired bearing angle value supplied by an



associated comparison value generator, and emits a bearing trace signal whenever there is coincidence between the measured bearing angle value and the preset bearing angle value. The bearing trace signals are in turn fed to the brightness control circuitry of the cathode-ray tube to cause the desired bearing traces to be produced on the screen. A plurality of bearing traces can be produced either by providing a plurality of parallelly connected bearing trace generators, each of which compares the measured bearing angle value with a different preset bearing angle value, or by connecting a storage device to the output of a single bearing trace signal generator which circulates stored data in synchronism with the momentary bearing angle and has its output also connected to the brightness control circuitry of the cathode-ray tube.

3,723,954

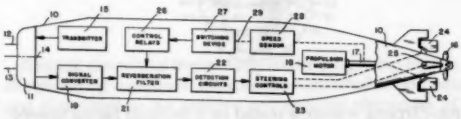
REVERBERATION FILTER SYSTEM

Arthur Nelkin, and John H. Thompson, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed Aug. 24, 1956, Ser. No. 606,177

Int. Cl. G01s 9/66

U.S. Cl. 340—3 R **5 Claims**



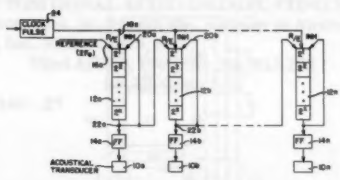
1. In a target-detection system carried by a propulsive craft, in combination, means for projecting target search signals, means for receiving resultant target echo signals accompanied by spurious reverberation signals, a reverberation-suppression filter system having a substantially constant attenuation-bandwidth characteristic but adjustable as to effective frequency limits thereof and connected to isolate the target echo signals from said reverberation signals, means constructed and ar-

ranged to adjust the frequency limits of said filter system in response to and in accordance with the varying speed of said propulsive craft, and means for utilizing the substantially reverberation-free echo signals.

3,723,955
BEAM FORMER

James Francis Lyons, Mineola, and Tullio DeFilippis, North Woodmere, both of N.Y., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 15, 1965, Ser. No. 507,963
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **10 Claims**

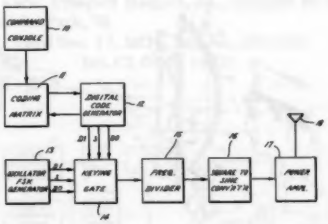


Apparatus for producing a beam of radiated energy comprises an array of transducers, a source of reference pulses for determining the frequency of the energy to be transmitted, a frequency divider connected to each of the transducers, and a source of clock pulses connected to the frequency dividers which determine the phase delay between the signals coupled to the respective transducers as a function of clock pulse frequency. Each of the frequency dividers includes an enabling input and an inhibit input with the output of each divider being coupled to its own inhibit input and the enabling input of the next adjacent divider. The reference pulses are coupled to the enabling input of the frequency divider associated with the first transducer. Where desired to shift the beam between 0° and 180°, the phase of the voltage applied to every other transducer element is shifted an additional 180° beyond that provided by the frequency divider.

3,723,956
ACOUSTIC CONTROL TRANSMITTER

Richard Jan Carman, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 5, 1970, Ser. No. 61,339
Int. Cl. H04b *11/00*
U.S. Cl. 340—5 R **5 Claims**

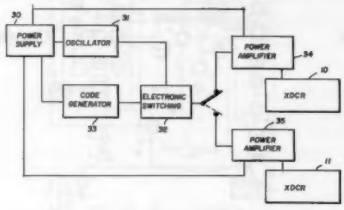


A transmitter which produces a secure acoustic command signal. The acoustic command signal preferably includes a predetermined number of time slots each including a space tone of one frequency followed by a data tone of another frequency. When a binary code is transmitted by the acoustic command signal, a data tone of a second frequency is transmitted, which represents a binary 1, and a data tone of a third frequency is transmitted, which represents a binary 0. The transmitter preferably includes a signal generator for generating a plurality of different frequency acoustic signals to provide the three different tone signals which make up the acoustic command signal, and a code generator for generating three different control pulses in a coded sequence in response to an operator command to provide a desired sequence of transmission of the space tones and data tones. The outputs of the signal generator and the code generator are combined in a gate circuit to provide the desired acoustic command signal, and means is provided for radiating the acoustic command signal for receipt by a remote receiver.

3,723,957
ACOUSTIC NAVIGATION SYSTEM

Melvin H. Damon, 27 Courtenay Circle, Pittsford, N.Y.

Filed Nov. 20, 1970, Ser. No. 91,315
Int. Cl. G01s *3/00*
U.S. Cl. 340—5 R **10 Claims**

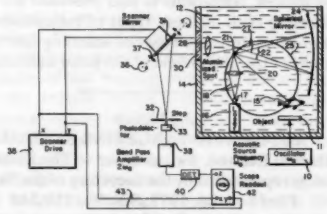


A pair of transducer arrays are aimed underwater at a small angle to each other, and a source of acoustic energy is switched back and forth between the transducers under the control of a code generator to produce a pair of nutating beams that have a complementary code. Analogs of the beams are displayed aurally aboard a vessel for distinguishing the two beams by their code signals and detecting the bisecting plane between the beams by a steady tone signal.

3,723,958
ACOUSTIC IMAGING SYSTEM

Lee O. Heflinger, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 9, 1971, Ser. No. 170,124
Int. Cl. H04n *3/02*
U.S. Cl. 340—5 MP **7 Claims**

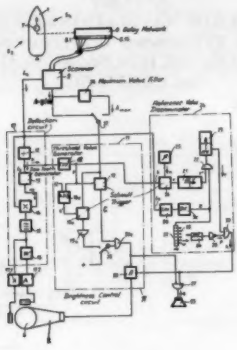


An acoustic imaging system which is particularly useful at low sound levels. A light beam is made to pass twice through a region where the light can interact with the acoustic wave perturbed by the object. As a result a light image is created which is modulated at twice the acoustic frequency. Thus, a portion of the light has a frequency which is raised while another portion of the light has its frequency decreased by the acoustic frequency. Therefore, the modulated light may readily be segregated from the unmodulated light, for example, by a suitable bandpass filter. Because the scattered light does not disturb the image it is feasible to use a higher light intensity so that an optical image is obtainable even at low acoustic intensity. Furthermore, the resolution is improved because the system has a large aperture.

3,723,959
APPARATUS FOR INDICATING ACOUSTICAL OR ELECTROMAGNETIC SIGNALS

Herbert Gritsch, Achim; Herwig Meyerhoff, Bremen; Enno Bruns, Bremen, and Gerd Hemmie, Bremen, all of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 16, 1970, Ser. No. 89,693
Int. Cl. G01s *3/00*
U.S. Cl. 340—6 R **23 Claims**

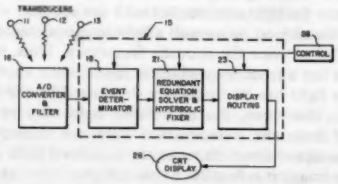


An improved apparatus for providing a polar coordinate indication at an image frequency which produces still pictures, e.g. on a cathode-ray tube, of a scanning function $A = g(x)$ furnished by an electronic scanner by scanning received acoustical or electromagnetic signals, e.g. from sonar or radar system, wherein A is the signal intensity and the independent variable x is the angle of incidence ϕ; the frequency for some other parameter of the received signal, wherein the independent variable x is indicated by the angular deflection of the indication and the signal intensity A is represented by the radial deflection of the indication. Various alternative types of representations of the scanning function utilizing this scheme are provided. According to one type of representation the course or shape of the scanning function curve may be indicated with respect to a zero reference circle, preferably with the area beneath the curve also indicated or brightened in the case of a cathode-ray tube indicating device. According to a further type of representation the maximum values of all or selected scanned signals are determined and indicated as radial lines or spokes. Apparatus is also provided for simultaneously presenting both of these types of indications or indications representing different types of scanning functions in different sectors of the image field of the polar indication.

3,723,960
AUTOMATIC TARGETING SYSTEM

Jack R. Harris, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 26, 1971, Ser. No. 119,246
Int. Cl. G01s *5/18*
U.S. Cl. 340—6 R **7 Claims**

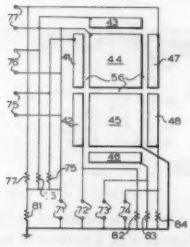


Method and apparatus for locating a target utilizing three or more acoustic sensors connected by a radio link to a general purpose digital computer. The respective sensor outputs are correlated in order to identify a common acoustic source; then the times of arrival of a discrete sound emanated by the source are compared for determining the coordinates of the source. The source coordinates are then displayed on a plan position indicator.

3,723,961
MESSAGE CHARACTER DISPLAY APPARATUS

Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.

Filed June 29, 1971, Ser. No. 157,901
Int. Cl. G08b *5/36*
U.S. Cl. 340—380 **7 Claims**

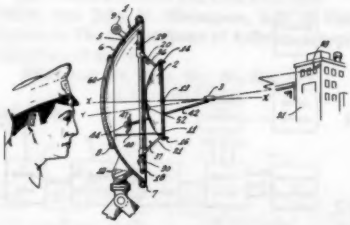


Message character display apparatus is described herein which uses an array of light conductors wherein light emitting ends thereof are divided into a predetermined array of character forming segments with which a number of different characters may be formed. When characters are presented they are viewed through a window of the apparatus which is used to support the light emitting ends of the array of conductors and, in combination with the array of conductors, is moulded to form a single unit of light conducting material. Mouldings of the window and character forming light conductors are shown and described in various character display apparatus embodiments of the invention.

3,723,962
APPARATUS FOR INDICATING THE DIRECTION TO A SOUND PULSE SOURCE

Fred Hotchner, 13400 Sherman Way, North Hollywood, Calif.

Filed Oct. 9, 1970, Ser. No. 79,493
Int. Cl. G01s *3/00*
U.S. Cl. 340—16 R **24 Claims**



Apparatus including a reflector constituting a part of a spherical, cylindrical or other concave reflecting surface and a thin film detector of concentric or flat planar shape located in the focusing zone of the reflector between the center of curvature and the reflecting surface. The detector is provided with means, such as a high cracking lacquer coating which will be fractured in the focal zone of the sound pulse, to provide a line-of-sight locating point which, in a three-element device, is combined with the center of curvature of the reflector to give the line-of-sight direction to the source of the sound pulse, the

focal point for any sound source falling on a line drawn through the center of curvature of the reflector to that source. Instead of the center of curvature, means indicating a line or plane therethrough may be used with the lacquer fracture point to determine the direction to the sound source. In a two-element device the detector may comprise a photographic film on which there appears an inverted image of the field of view whereby the location of the fracture point on the image indicates the direction to the sound source, in which case the center of curvature and the line or plane therethrough are unnecessary.

3,723,963

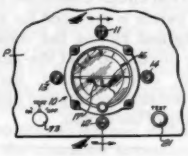
AIRCRAFT GYROHORIZON INDICATOR WITH SIGNAL LAMP POSITIONAL ATTITUDE INDICATING MEANS

Ralph Hernandez, Jr., Miami, Fla., assignor to Aircraft Instruments, Inc., Miami Beach, Fla.

Filed April 3, 1969, Ser. No. 813,252

Int. Cl. G08g *5/00*

U.S. Cl. 340—27 **2 Claims**



A combination gyrohorizon instrument for aircraft which visually indicates in addition to the dial display presentation of the instrument, by means of signal lamps appropriately placed with respect to the instrument dial, departures from straight and level flight that exceed reasonable limits of pitch and bank. The signal lamps, indicating "nose up", "nose down", "left wing down" and "right wing down" are in circuits energized by a first switching means controlled by the relative rotational position of the inner and outer gimbals of the instrument for sensing departure beyond reasonable safety limits in one direction or the other in the pitch axis, i.e., either "nose up" or "nose down" flight, and a second switch means controlled by the relative rotational position of the outer gimbal and the instrument casing for sensing departure beyond reasonable limits in the roll axis, i.e., either "left wing down" or "right wing down" flight.

3,723,964

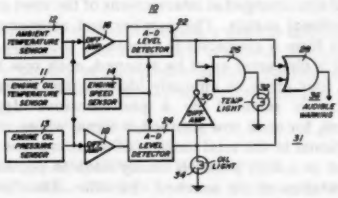
ENGINE CONDITION MONITORING APPARATUS

Melvin A. Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 17, 1971, Ser. No. 209,324

Int. Cl. G08b *19/00*

U.S. Cl. 340—52 F **5 Claims**



An internal combustion engine having an oil pressure lubricating system is provided with engine condition indicator apparatus to continuously monitor engine oil temperature and oil pressure during engine operation. Ambient temperature and engine oil temperature readings are compared to obtain a corrected temperature reading; engine oil temperature and oil pressure readings are also compared to obtain a corrected pressure reading. The corrected oil temperature and oil pressure signals are then compared to engine speed signals and electrical responses obtained respectively when the signals are of greater magnitude than the engine speed signals. Indicator means are provided to indicate occurrences of these electrical responses.

3,723,965

CONTROL UNIT FOR MONITORING ELECTRONIC CONTROL SYSTEMS FOR BRAKING DEVICES IN WHEELED VEHICLES

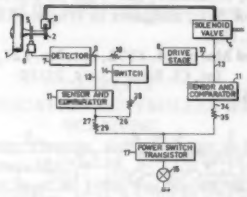
Gosta Holger Granlund, Goteborg, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed March 8, 1971, Ser. No. 122,018

Claims priority, application Sweden, March 13, 1970, 3350/70

Int. Cl. B60t *8/10*

U.S. Cl. 340—53 **3 Claims**



An arrangement for controlling and monitoring electronic control systems for the brakes of wheeled vehicles (motor cars) includes speed sensors, one for each controlled wheel, the output of each sensor being applied to a detector for detecting relative changes in speed of the wheel. The detector controls a number of solenoid valves to regulate the brake pressures for the individual wheels such that locking and skidding of any wheel is prevented. A delay circuit samples or senses the signal occurring in the output of the detector, which output is supplied to a driving stage driving the associated solenoid valve. The output of the delay circuit activates a comparator when the output of the detector results in a reduction or release of the braking power of one or more of the wheels of the vehicle during a period exceeding a normal transient period of the regulating system. When the comparator is activated, it energizes a switch provided for the associated driving stage such that the polarity of the output of this stage changes and results in switching on again the solenoid valve to open a braking-fluid connection to the normal, ordinary braking system of the vehicle. When the comparator is energized, a buzzer or signal lamp is also energized.

3,723,966

INTERROGATING TIRE PRESSURE INDICATOR

Rolf K. Mueller, Brighton, and William G. Wolber, Southfield, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

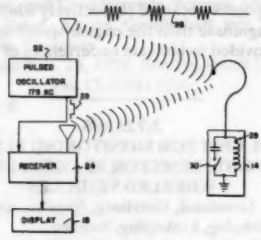
Filed Sept. 14, 1970, Ser. No. 71,706

Int. Cl. B60c *23/02*

U.S. Cl. 340—58 **8 Claims**

A tire pressure indicating arrangement in which a passive transponding element is used as the tire pressure condition responsive sensor at each tire and an active transmitter is used to interrogate either successively or simultaneously each

transponder, each of which is in turn adapted to transpond back to a receiver in response to the transmitter signal in the



event tire pressure declines to an unsafe level. The receiver signal is then used to activate an alarm or indicating device.

3,723,967

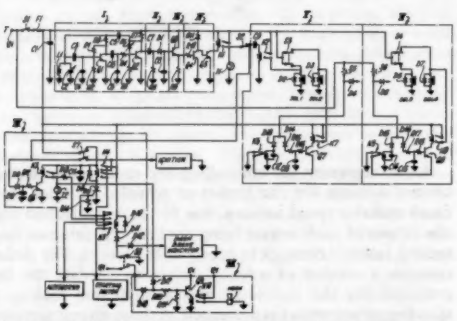
INDUCTION-KEYED DOOR-LOCK AND POWER CONTROL CIRCUIT FOR AUTOMOTIVE VEHICLES AND THE LIKE

Carl E. Atkins, Montclair, and Paul A. Carlson, New Providence, both of N.J., assignors to Wagner Electric Corporation, Newark, N.J.

Filed March 24, 1971, Ser. No. 127,463

Int. Cl. B60r *25/04, 25/10*

U.S. Cl. 340—63 **24 Claims**



A control circuit actuable by an inductive keying circuit, the inductor of which must be placed in a predetermined spatial relationship with the inductor in a tank circuit in the control circuit to effect keying. The energization and de-energization of a relay is thus controlled, and this relay in turn controls at least one door-unlocking solenoid. Circuitry is provided for automatically energizing each door-locking solenoid when the associated vehicle door is sequentially open and closed, and for manually energizing each of the locking and unlocking solenoids. Power control circuitry is also provided to prevent engine start-up by an unauthorized person who has broken into the vehicle, to energize an alarm circuit in such event when the unauthorized person actuates the starting switch, and to enable engine start-up by actuation of the starting switch within a predetermined length of time after an authorized person has unlocked the vehicle.

3,723,968

PARKING BRAKE ALARM

Wilfred J. Kelly, 84 Pavilion Ave., Providence, R.I.

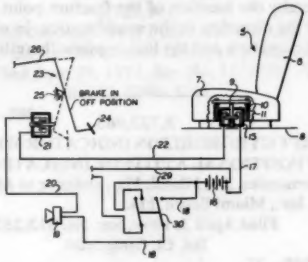
Continuation of Ser. No. 650,715, July 3, 1967, abandoned.

This application June 18, 1970, Ser. No. 48,925

Int. Cl. B60q *5/00;* **B60t** *17/22*

U.S. Cl. 340—69 **1 Claim**

An alarm effective to indicate that a vehicle parking brake is off when the driver moves from the driving position, if at that time, the parking brake is not on. A pressure sensitive means, mounted for example in the base of the driver's seat, is operatively connected to an alarm so that a signal is issued by the alarm upon movement from the driving position, with the proviso that means are provided for making the alarm insensitive to such movement if the parking brake is on. The alarm is



an auxiliary electrical circuit connected in parallel with the ignition system. A switch is provided for selectively and simultaneously opening and closing the vehicle electrical system and the auxiliary circuit, so that the auxiliary circuit can be deenergized, and, if deenergized, the ignition system is deenergized and remains deenergized until the alarm system is activated by closing of the switch.

3,723,969

METHOD OF AND APPARATUS FOR READING CHARACTERS FORMED BY A PLURALITY OF AREAS

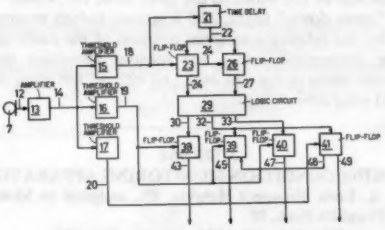
Kurt Thaddey, Buchs/Zurich, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed July 30, 1970, Ser. No. 59,650

Claims priority, application Switzerland, Aug. 7, 1969, 12100/69

Int. Cl. G06k *9/18*

U.S. Cl. 340—146.3 Z **5 Claims**

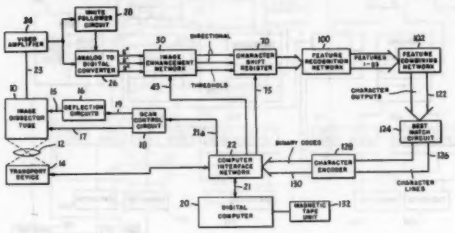


The invention provides a method of and apparatus for reading characters formed by a plurality of areas, or perforations of equal size arranged at intersections of the rows and columns of a notional matrix. The number and arrangement of the areas to form a character is chosen so that only three rows forming a character need be scanned, each row having one, two or four areas to uniquely identify that character. Each character is scanned by a photosensitive device which produces, for each row scanned, a signal whose magnitude is proportional to the total number of areas in a row. The signal is coded in a four position binary code to provide a binary representation of the scanned character. The first and third positions of the code are assigned to the values derived from scanning the first and third of the three rows and the second and fourth code positions assigned to the value of the signal produced on scanning the second of the three rows. If the maximum number of areas in a row occurs in the second row, the fourth position assumes a binary value '1' while the second position assumes a binary value '0.'

3,723,970
OPTICAL CHARACTER RECOGNITION SYSTEM

Milton Stoller, West Hartford, Conn., assignor to Scan-Optics, Inc., East Hartford, Conn.

Filed Jan. 4, 1971, Ser. No. 103,646
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 MA 19 Claims

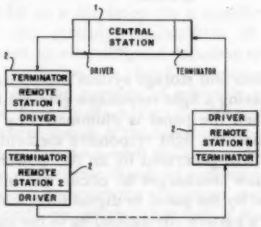


As described herein, a program controlled image dissector tube scans the printed information recorded on a storage medium to provide analog information signals. The analog signals are converted into digital data signals representative of the segmental brightness of the scanned storage medium and thereafter accumulated in an image enhancement network. In the image enhancement network, selected arrays of the signals are scanned to develop directional and threshold digital data bits representative of the character information contained in each of the arrays. These digital data bits are, in turn, accumulated to provide arrays of the digital data bits representative of entire characters. The presence or absence of selected digital data bits in each of the arrays is then detected and the detected digital data bits combined to provide a character representative signal.

3,723,971
SERIAL LOOP COMMUNICATIONS SYSTEM

William K. Betts, and Alexander P. Sawtschenko, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1971, Ser. No. 207,862
Int. Cl. H04q 9/00
U.S. Cl. 340—163 R 5 Claims



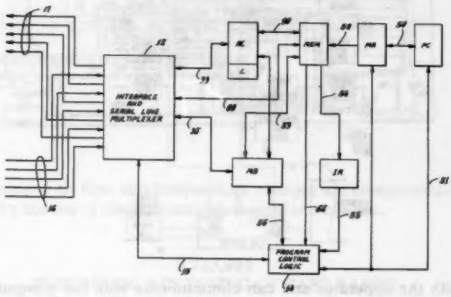
A communications system including a central station connected in a series loop with a plurality of remote stations and in which under control of said central station, the remote stations in the order of their physical position transmit data to the central station.

3,723,972
DATA COMMUNICATION SYSTEM

Ashwani K. Chadda, 200 St. Andrews Boulevard, Winter Park, Fla.

Continuation of Ser. No. 874,301, Nov. 5, 1969. This application Nov. 24, 1971, Ser. No. 216,316
Int. Cl. G06f 3/04
U.S. Cl. 340—172.5 17 Claims

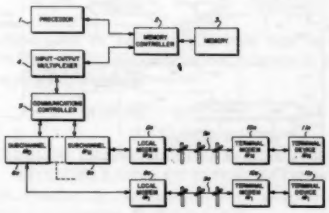
The disclosed data communication system is adapted to handle data flow to and from a plurality of individual data stations. The system assembles bits of data characters randomly and asynchronously transmitted by periodically sampling input lines in succession for input bits. The input bits are assembled and stored at selected times during each bit transmission. Fully assembled characters are transferred to a new storage location for eventual transmission to a central station. The system is also adapted to transmit data characters back to appropriate ones of the individual data stations at acceptable rates.



3,723,973
DATA COMMUNICATION CONTROLLER HAVING DUAL SCANNING

James A. Kennedy, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.

Filed Sept. 30, 1970, Ser. No. 76,787
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 1 Claim



A data communications controller connected to a plurality of subchannels scans all subchannels when a priority switch is open. When the priority switch is closed a selector switch can be used to choose one of several combinations of subchannels which are awarded priority over other subchannel being scanned.

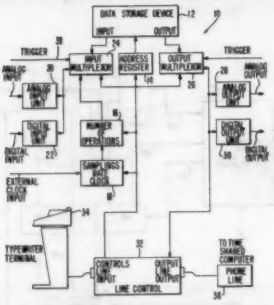
3,723,974
DATA COLLECTION APPARATUS AND METHOD

Klaus E. Holtz, Adalbertstrasse 104, Munich, Germany

Filed March 8, 1971, Ser. No. 121,657
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 11 Claims

Apparatus and a method of collecting data from analog or digital sources wherein the data is initially stored in accordance with a particular program and then read out to a time-share computer remote from the data collection station. Any one of a number of different programming languages can be used to effect the storage and read-out of the data and communication with the time-share computer can be accom-

plished under existing transmission facilities in a format acceptable to the computer. A typewrite terminal can be utilized



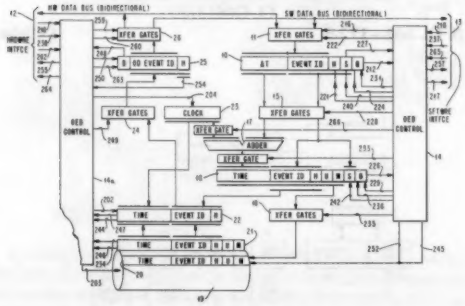
with the apparatus and can communicate with the computer without interferrence from the apparatus.

3,723,975

OVERDUE EVENT DETECTOR

Hobart L. Kurtz, Jr., Wappingers Falls; Glenn H. Smith, Hyde Park, and Charles H. Wolff, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 28, 1971, Ser. No. 157,134
Int. Cl. G06f *9/00, 11/04*
U.S. Cl. 340—172.5 **6 Claims**



An event detector for providing signals to general purpose digital computer hardware and/or software when excessive time passes prior to event occurrence. The detector includes storage means to record pluralities of sensitive events together with a time by which the event must be completed and clocking and comparator means to calculate target times and detect overruns.

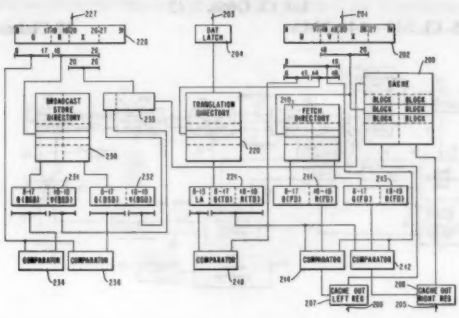
3,723,976

MEMORY SYSTEM WITH LOGICAL AND REAL ADDRESSING

Joseph A. Alvarez, Monrovia, and Robert P. Barner, Jr., Rockville, both of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 20, 1972, Ser. No. 219,362
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **11 Claims**

A memory system is disclosed for use in a multiprocessing environment where each processor has associated with it a buffer memory and means are provided for one buffer to retain a modified copy of data. The contents of the buffer memory may be accessed by either real or logical addresses. Address translation means are provided to translate logical addresses. A fetch directory is provided to keep track of the data in cache. The fetch directory entries are accessed by both logical and real portions of the desired data address. Means are



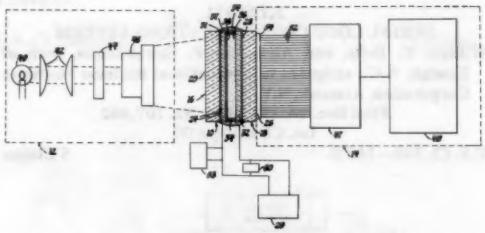
provided to insure that only one copy of data is maintained in the buffer although it may be entered at several cache locations dependent upon the logical address which last fetched the data.

3,723,977

GAS DISCHARGE PANEL WITH PHOTOCONDUCTIVE MATERIAL

Robert F. Schaufele, Okemos, Mich., assignor to Owens-Illinois, Inc.

Filed Dec. 8, 1969, Ser. No. 882,933
Int. Cl. G11c *11/28;* **H01j** *15/00;* **H05b** *41/00*
U.S. Cl. 340—173 PL **25 Claims**



A data conversion and storage system incorporating a gas discharge panel having a light responsive element for sensing external light. When the panel is illuminated by projecting light onto the panel, the light responsive element combines with the electric field generated by an AC power source to cause selective glow discharges to occur. In this way, the image is converted by the panel to digital form with the glow discharges having a pattern corresponding to the image. After the image is removed, this information is stored until erased and also non-destructive transfer can be made to a readout device.

3,723,978

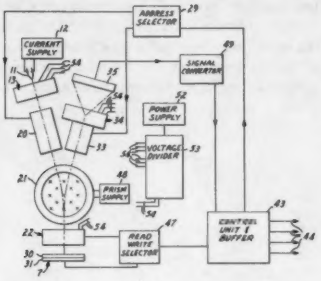
BEAM ADDRESSABLE MEMORY APPARATUS

Kent N. Maffitt, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed March 1, 1971, Ser. No. 119,630
Int. Cl. G11c *11/26*
U.S. Cl. 340—173 CR **10 Claims**

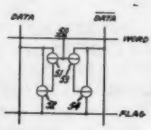
Beam addressable memory apparatus including an electron gun having a compound electrostatic immersion gun lens, a first set of electrostatic deflection plates, and a compound electrostatic immersion objective lens for writing charged bits of information on a storage media. During the reading mode,

the storage media is negatively biased to mirror and spacially modulate the electron beam. The mirrored beam is passed back through the objective lens, a second set of electrostatic



deflection plates, and a projector lens onto a detector array for producing simultaneous digital electrical signals corresponding to the bit pattern on the media.

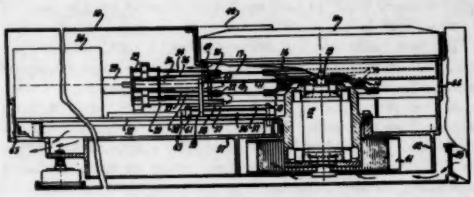
3,723,979
ASSOCIATIVE MEMORY SYSTEM
Joseph L. Mundy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Nov. 1, 1971, Ser. No. 194,678
Int. Cl. G11c *15/00*
U.S. Cl. 340—173 AM **10 Claims**



An associative memory system is disclosed for grouping events in *n* dimensional space wherein each event is represented by an *n* bit word. As a specific example of the comparison and grouping capabilities of this associative memory system, an encoding and decoding system is disclosed wherein the separation of a plurality of messages can be made a maximum and the number of tolerable errors set to any desired value. Specifically, to decode, the output current, during an associative search of the memory, is proportional to the separation between the search message and the stored, error-free message. Adjustable threshold sensing of the output current enables one to select the maximum amount of tolerable error. To encode, an associative search is made for the coded version of a message utilizing the uncoded version of the message.

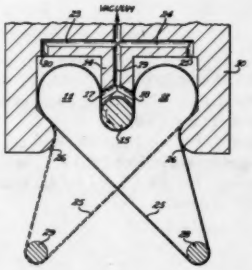
3,723,980
TEMPERATURE COMPENSATION SYSTEM FOR A MAGNETIC DISK MEMORY UNIT
Andrew Gabor, 371 Cordell Drive, Danville, Calif.
Filed Nov. 15, 1971, Ser. No. 198,882
Int. Cl. G11b *5/40*
U.S. Cl. 340—174.1 B **9 Claims**

A temperature compensation system for a magnetic disk memory unit which is removable from a disk drive unit in which the transducer which is part of the track positioning system is located in the same temperature and mechanical environment as the magnetic disks and read/write heads. All active elements are kept at a substantially uniform temperature



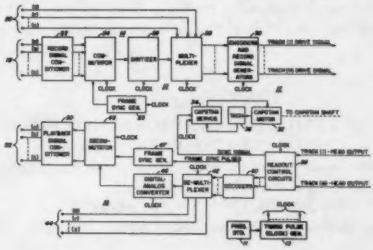
by proper air flow and temperature changes are compensated for by the use of similar materials in similar locations.

3,723,981
PNEUMATIC ACCESSING OF TAPE BANDS
Klaus K. Stange, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Oklahoma City, Okla.
Filed July 17, 1962, Ser. No. 219,519
Int. Cl. G11b *15/38*
U.S. Cl. 340—174.1 C **29 Claims**



An endless loop or barn of magnetic tape is selectively withdrawn from its bin into a chamber wherein it is caused to move by a rotating capstan.

3,723,982
SYSTEM FOR TRANSMISSION, STORAGE AND/OR MULTIPLEXING OF INFORMATION
William R. Frazier, Jr., Indialantic, Fla., assignor to General Dynamics Corporation, Rochester, N.Y.
Division of Ser. No. 685,353, Nov. 24, 1967, Pat. No. 3,588,836. This application Feb. 2, 1971, Ser. No. 112,003
Int. Cl. G11b *5/62*
U.S. Cl. 340—174.1 G **19 Claims**



A system is described for transmission, storage (as by recording) and for multiplexing of both digital and analog information. The recording system includes apparatus for con-

verting analog information into digital information having a predetermined format. Each track of the recording apparatus receives a series of encoded format words containing a plurality of ternary NRZ pulses, each represented by any one of three voltage levels; positive, negative or zero volts during a bit interval, such that the average level of each word is zero volts. The spectrum of a signal composed of a serial sequence of these format words is capable of being recorded on a magnetic tape recording track with a much higher pulse packing density than heretofore possible with conventional NRZ or other binary recording techniques. The playback apparatus which forms part of the recording system includes circuitry responsive to the zero average property of the recorded words, and controls the timing of the readout of the recorded information so as to provide precise time coherence between all of the recorded channels. The latter circuitry also controls the system for deskewing the signals recorded simultaneously on parallel tracks on the tape during playback, thereby further enhancing the capability of this system to record information with extremely high pulse packing density. Both recording and playback is controlled by a common accurate clock so as to further insure coherence between signals recorded on all channels. Also included in the recording system is an input/output section which translates input analog information into digital form for recording in the various channels at rates and with the format compatible for recording with the system. The input/output section also rearranges the digital information read from the magnetic record into its original analog or digital form, as the case may be.

3,723,983

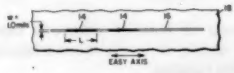
HIGH DENSITY THIN FILM REGISTER

Heinz Lienhard, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 761,054, Sept. 20, 1968, abandoned. This application March 19, 1971, Ser. No. 126,309

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 MC **5 Claims**



Improved magnetic thin film geometry for use in shift registers, etc., wherein the thin film strips, and thus the magnetic domains, have a preselected width to length (W/L) ratio, film thickness (T), and value of coercive force (H_c). The geometry provides storage and transfer of stable magnetic domains with well-defined boundaries, and decreased interaction and spurious nucleation, while allowing relatively high packing densities. The parameters are chosen as to maximize ($H_N - H_W$) where H_W is the magnetic domain nucleation field, H_N is the magnetic domain wall threshold field, and $H_N - H_W$ is the operational margin of the film strip. By suitably selecting the above parameters, optimum packing density and speed of domain wall motion, with stable domain storage conditions, are realized.

3,723,984

STORAGE DEVICE FOR THE STORAGE OF WORD-ORGANIZED INFORMATION

Gerrit Hilbertus Schouten, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

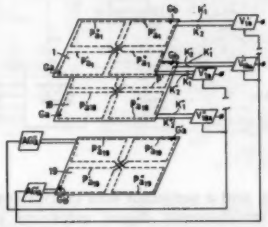
Filed July 20, 1971, Ser. No. 164,276

Claims priority, application Netherlands, July 22, 1970, 7010815

Int. Cl. G11c *5/08*

U.S. Cl. 340—174 RC **1 Claim**

A storage device for the storage of word-organized information, comprising magnetic storage elements which are arranged in a plurality of planes in rows and columns in an identical manner, each of said magnetic storage elements being coupled to a first drive winding which is provided per row, to a second drive winding which is provided per column, and to an inhibit and a sense windings which are provided per plane. Each sense winding is provided with a read amplifier connected thereto. Each of these read amplifiers is provided with a control terminal to which a sense generator is connected for sampling the signals which are induced in the sense windings. Furthermore, an additional surface is provided comprising magnetic storage elements which are arranged in rows



and columns in an identical manner as in said planes and which are individually associated with word locations. The storage elements of the additional plane are coupled to a first drive winding which is provided per row and to a second drive winding which is provided per column in order to set the storage elements to one particular remanence state in the case of writing and to set them to the other remanence state in the case of reading of words in the corresponding word locations. For reading the information the storage elements of the additional plane are coupled to a sense winding which is connected to the sense generator in order to apply starting pulses thereto.

3,723,985

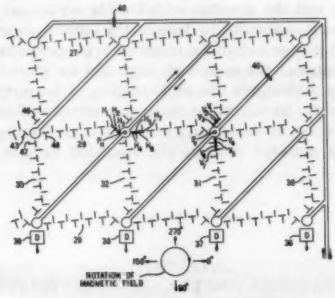
ELECTRICALLY CONTROLLABLE STEERING ARRANGEMENT FOR MAGNETIC SINGLE-WALL DOMAIN PROPAGATION PATHS

Roy Stephen Krupp, Rumson, and Lawrence Andrew Tomko, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 27, 1971, Ser. No. 212,005

Int. Cl. G11c *11/14, 19/00*

U.S. Cl. 340—174 TF **10 Claims**



An electrically controllable transfer circuit located at the intersection of plural magnetic single-wall domain field access propagation paths is provided with electric current pulses that are differently phased with respect to an in-plane rotating magnetic field for determining the direction of domain propagation through the intersection. A plurality of such path intersections are interconnected to form row and column shift

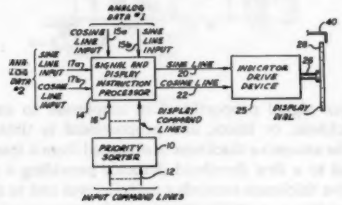
registers of a two-dimensional shift register. All of the transfer circuits are connected to be driven together to realize propagation in two different directions in each field access cycle.

3,723,986

TELEMETERING SYSTEM FOR DISPLAYING ANALOG AND DIGITAL DATA

Joseph Carlstein, East Meadow, N.Y., assignor to Vernitron Corporation, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 863,754
Int. Cl. G08c 19/04
U.S. Cl. 340—177 R 8 Claims



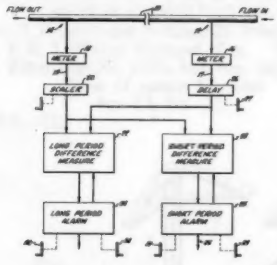
This system displays both analog and digital data such as quantities and messages with predetermined display priorities assigned to the several messages or types of data. In operation, commands pass through a priority sorter to a signal and display processor which in turn passes currents of predetermined magnitudes and polarities to an electromagnetic indicator drive device. The drive device has two stator windings which generate magnetic fields 90° apart and drive a rotor coupled to an indicator, bearing prerecorded data thereon, for display and readout purposes.

3,723,987

METHOD AND APPARATUS FOR MONITORING FLUID FLOW SYSTEMS

Larry F. Barone, Jr., Santa Ana, Paul E. Patterson, Bell, and Ross A. Shade, Santa Ana, all of Calif., assignors to Mobil Oil Corporation by said Patterson; ADEC Corporation, Irvine, Calif., by said Barone and said Shade.

Filed March 22, 1971, Ser. No. 126,506
Int. Cl. G08b 21/00
U.S. Cl. 340—242 5 Claims



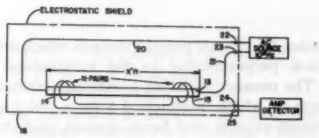
A system for detecting leakage in a long pipeline employs meters to generate digital flow signals at stations adjacent inputs and outputs of the pipe system. A scaler function equal to the difference in the input and output flow of the system, as indicated by the meters, is computed when the system is known to be in a leak-free condition. The scaler function is combined with one of the meter representations of system input or output to provide a dynamic balance of input and output, as indicated by the meters. Subsequent deviation from balanced condition is employed to actuate an alarm. Signals from the upstream station are delayed by the amount of time required for a flow disturbance to propagate between input and output stations so as to eliminate effects of such disturbance upon the input-output comparison. Input and output flows are compared concomitantly for both short and long periods to enable rapid detection of large leaks and also detection of much smaller leaks.

3,723,988

ANISOTROPIC THIN FILM PLATED WIRE LINE SENSOR

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 4, 1971, Ser. No. 195,690
Int. Cl. G08b 13/24
U.S. Cl. 340—258 R 4 Claims



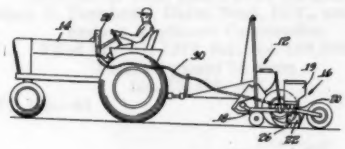
An electrically conductive wire is plated with a thin film of a magnetically anisotropic substance. A plurality of coils are placed around the wire at different points along its length. Either the wire or the coils are energized by an alternating current, and the signal developed on the other is monitored to detect intrusion of a magnetic body into the vicinity.

3,723,989

ELECTRONIC PLANTER MONITOR

George H. Fathauer, and David F. Fathauer, both of Decatur, Ill., assignors to Dickey-john Corporation, Chatham, Ill.

Filed Feb. 12, 1970, Ser. No. 10,930
Int. Cl. G08b 21/00
U.S. Cl. 340—259 21 Claims



A seed planting apparatus is disclosed for planting seeds concurrently in a plurality of rows including bin assemblies or hoppers for releasing a plurality of seeds along a path of travel and at a preselected rate. The apparatus includes a detecting circuit associated with each bin assembly or hopper for electrically detecting the plurality of seeds. A source of light is mounted on one side of the path of travel and a photocell is mounted on the other side of the path of travel optically aligned with the source of light. The photocell emits an electri-

cal signal when a seed passes between the photocell and source of light. A monitoring device is also included and is responsive to the electrical signal for monitoring the plurality of seeds.

3,723,990

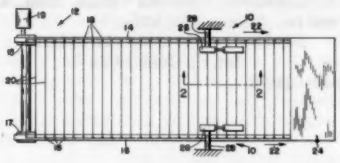
STRAND MONITOR

Frederick W. Paul, Holden, Mass., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Aug. 25, 1971, Ser. No. 174,759

Int. Cl. D03d *51/30*

U.S. Cl. 340—259 **5 Claims**



A monitor for spaced parallel strands which are conveyed in a direction perpendicular to the longitudinal axes of the strands. The monitor includes a stationary switch which has a switch arm to which is attached a shoe which spans at least two adjacent strands and bears against said strands as they pass by the shoe in which case the switch arm will be in a detecting position and will move to an indicating position when a broken or slack strand passes by said shoe.

3,723,991

OVERSIZE FILAMENT THICKNESS DETECTOR, PARTICULARLY EXCESSIVE THREAD THICKNESS AND KNOT DETECTOR FOR YARNS

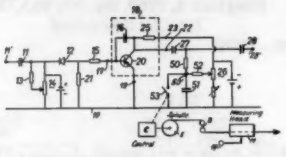
Hermann Schwartz, Adliswil, Switzerland, assignor to Siegfried Peyer, Bach, Switzerland

Filed Oct. 1, 1970, Ser. No. 77,189

Claims priority, application Switzerland, Oct. 31, 1969, 16253/69

Int. Cl. B65h *63/06*

U.S. Cl. 340—259 **10 Claims**



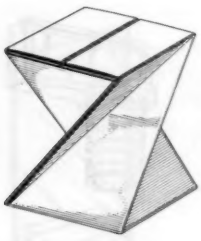
An output signal proportional in amplitude to excessive thread thickness, or knots, and proportional in time to the length of the excessive thickness is obtained from a transducer and applied to a first threshold detector providing a pulse if the excessive thickness exceeds a certain level and to a timing circuit providing a gradually rising signal proportional to time of persistance of the excessive thickness. To compensate for speed variations during start-up of the apparatus, for example after shut-down due to elimination of an excessive thickness of excessive length, a wave shaping signal transfer circuit is incorporated in the timing circuit, consisting for example of an R-C network having a charge-time characteristic similar to the acceleration function of the spooling equipment.

DESIGNS

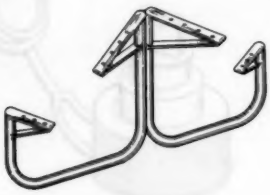
MARCH 27, 1973

226,544
CAP
Nicholas Veltri, 1183 Elmwood Ave., Buffalo, N.Y. 14202
Filed Nov. 11, 1971, Ser. No. 198,078
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—247

226,545
STOOL OR SIMILAR ARTICLE
Alfred D. Hollingsworth, 1575 Old Topanga Canyon Road, Topanga Canyon, Calif. 90240
Filed May 14, 1971, Ser. No. 143,736
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—34



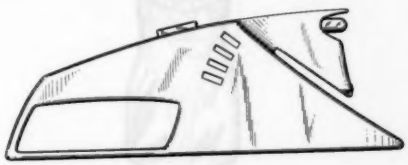
226,546
END FRAME UNIT FOR A TABLE AND BENCH COMBINATION
Marvin J. Priefert and William D. Priefert, both of R.R. 1, Mount Pleasant, Tex. 75455
Filed July 12, 1971, Ser. No. 161,408
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—192



226,547
HANGER FOR DISPLAY PACKAGE
Naoyuki Iso, 3 of 27 Oimatsu-cho, Nishinomiya, Hyogo, Japan
Filed Dec. 1, 1971, Ser. No. 203,939
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—252

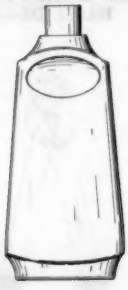
226,548
CUTTING TOOL
Oscar B. Burgeson, Bristol, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed May 11, 1971, Ser. No. 142,437
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—58

226,549
HOUSING FOR ELECTRIC SHEARS
Robert N. Freedman, Great Neck, N.Y., assignor to Endura Appliance Corporation
Filed Jan. 21, 1971, Ser. No. 108,691
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—61



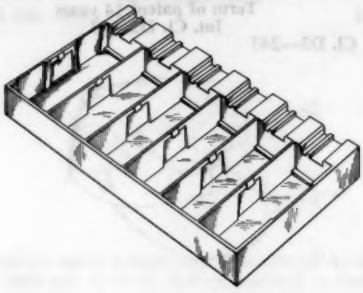
226,550
ESCUTCHEON PLATE WITH PUSHBUTTON FOR DOORBELLS
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed Mar. 27, 1972, Ser. No. 238,748
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—181

226,551
BOTTLE
Richard L. Weckman, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Oct. 1, 1971, Ser. No. 185,926
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44



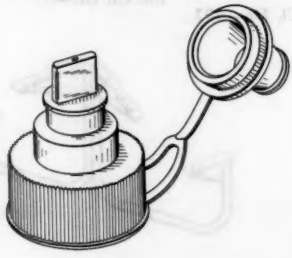
226,552
CARAFE
Wayne M. Smythe, 11967 E. Rivera Road, Santa Fe Springs, Calif. 90670
Filed Apr. 23, 1971, Ser. No. 137,113
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

226,553
DISPENSER FOR RAZOR BLADE CARTRIDGES
Martin Glaberson, Ardsley, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 22, 1971, Ser. No. 191,959
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189

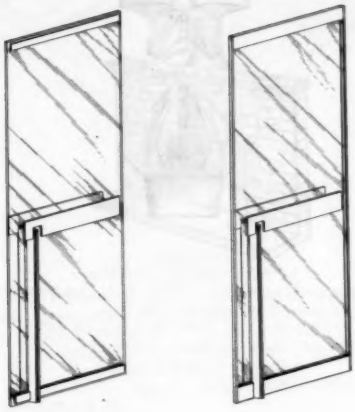


226,554
CONTAINER STOPPER OR THE LIKE
Louis Brodsky, Parlin, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.
Filed May 19, 1971, Ser. No. 145,102
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—264

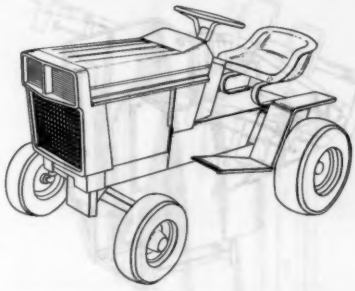
226,555
BOTTLE CAP
Heinz Weber, Dorval, Montreal, Canada, assignor to Quality Oil Corporation, Dorval, Montreal, Canada
Filed Apr. 2, 1971, Ser. No. 130,871
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—278



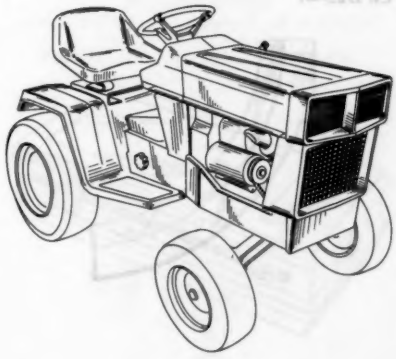
226,556
DOOR
William J. Horgan, Jr., 1299 Folkstone Drive, Pittsburgh, Pa. 15216
Continuation-in-part of design applications Ser. No. 10,892, Mar. 8, 1968, Ser. Nos. 13,607 and 13,608, both July 18, 1968, Ser. No. 19,456, Oct. 8, 1969, Ser. Nos. 20,194 and 20,195, both Nov. 20, 1969, Ser. No. 19,657, Oct. 21, 1969, Ser. No. 20,029, Nov. 10, 1969, Ser. Nos. 21,815, 21,816 and 21,811, all Mar. 9, 1970. This application June 1, 1970, Ser. No. 23,254
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 M



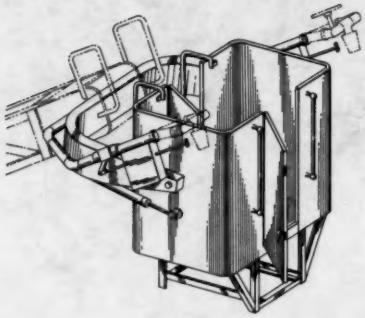
226,557
TRACTOR
Robert A. Skyer, Palatine, George E. Bowman, Country Club Hills, and David A. Fulghum, La Grange, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Jan. 20, 1972, Ser. No. 219,598
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3 A



226,558
TRACTOR
Robert A. Skyer, Palatine, George E. Bowman, Country Club Hills, James W. Zurek, Lombard, Rudolph A. Boehm, Downers Grove, and Joseph P. Deschamps, Naperville, Ill., assignors to International Harvester Company, Chicago, Ill.
Filed Jan. 20, 1972, Ser. No. 219,597
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3 A

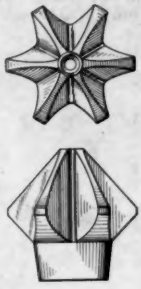


226,559
PLATFORM AND SUPPORT YOKE FOR AN AERIAL TOWER
Thomas C. Sutphen, Columbus, Ohio, assignor to Sutphen Fire Equipment Company, Amlin, Ohio
Filed Feb. 22, 1971, Ser. No. 117,872
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—6 A



226,560
AMMUNITION MAGAZINE
Leroy James Sullivan, Orange, Calif., assignor to J. Robert Egan, Newport Beach, John Wayne, Beverly Hills, and Robert L. Gaddis, Marie Lyon Gaddis, and Leroy James Sullivan, Huntington Beach, Calif., fractional part interest to each
Filed Dec. 9, 1970, Ser. No. 26,378
Term of patent 14 years
Int. Cl. D22—*03*
U.S. Cl. D22—7

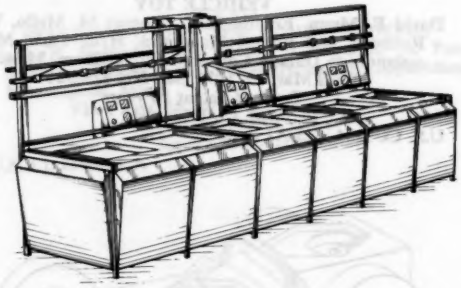
226,561
HANDLE FOR PLUMBING FITTINGS
Lloyd K. Jones and Martin W. Downey, Morgantown, W. Va., assignors to Rockwell Manufacturing Company, Pittsburgh, Pa.
Filed Oct. 30, 1970, Ser. No. 25,742
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—28



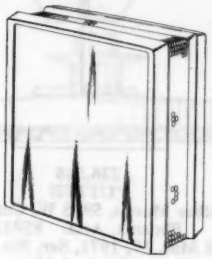
226,562
PORTABLE WASHING STAND
Roman Zakaski, South Charleston, W. Va., assignor to Monty Enterprises, Inc.
Filed Mar. 19, 1971, Ser. No. 126,388
Term of patent 7 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

226,563
PREFABRICATED FIREPLACE
William G. Hardt, 19 Shady Lane, Lake Geneva, Wis.
Filed Nov. 22, 1971, Ser. No. 201,250
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94

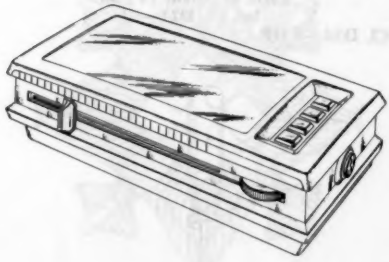
226,564
MODULAR AUTOMATIC ELECTROPLATING EQUIPMENT
Rudolf John Garbely, Bloomfield, and Anthony R. Diorio, Wayne, N.J., assignors to Sel-Rex Corporation, Nutley, N.J.
Filed May 7, 1968, Ser. No. 11,813
Term of patent 14 years
The portion of the term of the patent subsequent to Sept. 27, 1984, has been disclaimed
Int. Cl. D15—*09*
U.S. Cl. D26—1 N



226,565
SUBSCRIBER TERMINAL CENTRAL UNIT
Peter P. Klepa and Thomas J. Hermann, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed July 6, 1971, Ser. No. 160,266
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



226,566
SUBSCRIBER TERMINAL CONSOLE
Peter P. Klepa and Thomas J. Hermann, Los Angeles, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed July 6, 1971, Ser. No. 160,267
Term of patent 7 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

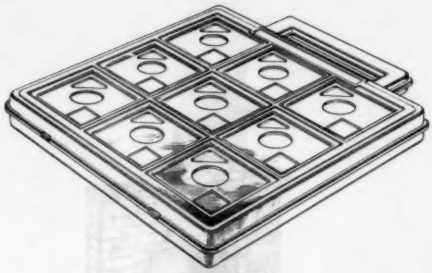


226,567
DODECAHEDRON LOUDSPEAKER ENCLOSURE UNIT
George W. Sioles, 267 Palos Verdes Drive W., Palos Verdes Estates, Calif. 90274
Filed May 1, 1972, Ser. No. 249,466
Term of patent 7 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

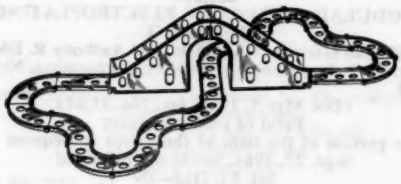
226,568
PUTTER
J. E. Luther Morris, 5925 W. Cataline Drive, Phoenix, Ariz. 85033
Filed Mar. 17, 1971, Ser. No. 125,455
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

226,569
HOOP ROLLER
Salvatore D. Timpani, 119 Furlong Road, Brighton, N.Y. 14623
Filed Apr. 12, 1971, Ser. No. 133,467
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 HP

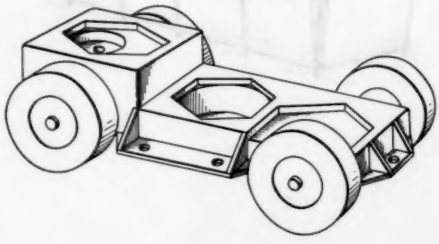
226,570
GAME BOARD
Roy M. Neece, Fort Worth, Tex., assignor to Tempo-Toy, Fort Worth, Tex.
Filed Nov. 5, 1971, Ser. No. 196,261
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



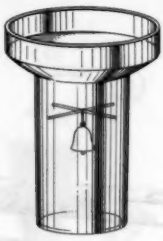
226,571
TOY TRACKWAY
Norman Spiegel, New York, N.Y., assignor to Nasta Industries, Inc.
Filed Dec. 14, 1970, Ser. No. 26,495
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 MM



226,572
VEHICLE TOY
David E. Munn, Framingham, Thomas M. Mello, West Roxbury, and Robert Maddestra, Hyde Park, Mass., assignors to Damon Corporation, Needham, Mass.
Filed Mar. 29, 1971, Ser. No. 129,324
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



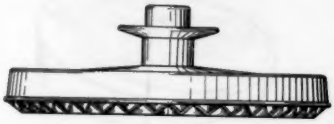
226,573
BEVERAGE GLASS
Donald E. Casad, General Delivery, Auberry, Calif. 93602
Filed Dec. 30, 1971, Ser. No. 214,526
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D36—8 B



226,574
RIDING MOWER BODY
Mario F. Fernandez and Robert L. Rydeen, St. Paul, Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.
Filed Aug. 30, 1971, Ser. No. 176,436
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 R

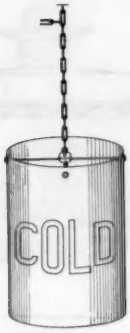
226,575
STEERING WHEEL FOR RIDING MOWERS
Mario F. Ferdandez and Robert L. Rydeen, St. Paul Minn., assignors to Toro Manufacturing Corporation, Minneapolis, Minn.
Filed Aug. 30, 1971, Ser. No. 176,434
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D40—1 A

226,576
CONTAINER CLOSURE OR THE LIKE
James B. Swett, Barrington, and Jack V. Croyle, Woonsocket, R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 9, 1971, Ser. No. 122,641
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1 B



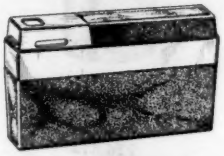
226,577
PENDANT OR THE LIKE
Charlotte Linnea Schwarz, Bridgeport, Conn., assignor to Wallace Silversmitlis, Inc.
Filed Feb. 9, 1972, Ser. No. 225,018
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

226,578
COMBINED LAMP SHADE AND CHAIN THEREFOR
Emmett L. O'Neill, 2515 Chelsea Drive, Oakland, Calif. 94611, and Emmett R. Anderson, 12510 Jolene Court, Saratoga, Calif.
Filed Apr. 28, 1971, Ser. No. 138,407
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16



226,579
NECKLACE
Victor Manuel, 491 NW. 44th Ave., Fort Lauderdale, Fla. 33313
Filed Aug. 10, 1971, Ser. No. 170,675
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 A

226,580
POCKET LIGHTER
Peter Weissmann, Schnaittach, Germany, assignor to Consul Gesellschaft mit beschrankter Haftung, Nurnberg, Germany
Filed Aug. 25, 1971, Ser. No. 175,039
Claims priority, application Germany Mar. 31, 1971
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27 R



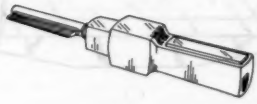
226,581
CIGARETTE LIGHTER
Kenjiro Goto, Tokyo, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi-shi, Saitama, Japan
Filed Dec. 27, 1971, Ser. No. 212,851
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D48—27

226,582
COMBINED LANTERN AND INSECT KILLER AND POST THEREFOR
Robert E. Iannini, Milford, N.H., assignor to Rid-O-Ray Inc., Milford, N.H.
Filed May 17, 1971, Ser. No. 144,397
Term of patent 14 years
Int. Cl. D26—*03;* D22—*06*
U.S. Cl. D48—31

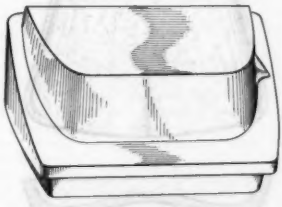
226,583
HAND PIECE FOR A COMBINED SKIN STIMULATING AND CLEANING DEVICE
Medard W. Welch, 1111 Sheridan Road, Winnetka, Ill. 60093
Filed Jan. 20, 1971, Ser. No. 108,253
Term of patent 14 years
Int. Cl. D24—*05, 99*
U.S. Cl. D83—1

226,584
COMBINED ASHTRAY AND CIGARETTE LIGHTER OR SIMILAR ARTICLE
Samuel J. Koch, % Korex Industries, 821 Malcolm Road, Burlingame, Calif.
Filed Sept. 17, 1971, Ser. No. 181,654
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D85—2 L

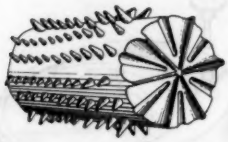
226,585
HOT COMB
William J. Rakocy, Clifton, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Jan. 14, 1972, Ser. No. 218,056
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8



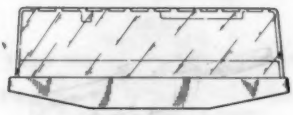
226,586
HEATER HOUSING FOR ELECTRIC HAIR CURLERS
Clifford E. Grube, Niles, Ill., assignor to Associated Mills, Incorporated
Filed Dec. 28, 1970, Ser. No. 26,667
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



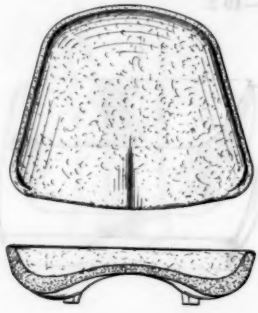
226,587
HAIR CURLER
Erik Keldmann, Jerslev, Denmark, assignor to Bristol-Myers Company, New York, N.Y.
Filed Feb. 10, 1971, Ser. No. 114,410
Claims priority, application Denmark Aug. 17, 1970
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E



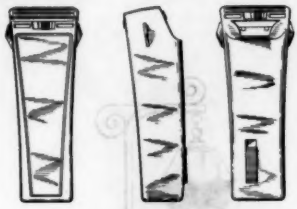
226,588
CASE FOR ELECTRIC SKIN HYGIENE BRUSH
John L. Benty, Scotch Plains, N.J., and Dominic Defano, Palatine, Ill., assignors to Clairol Incorporated, New York, N.Y.
Filed May 27, 1971, Ser. No. 147,723
Term of patent 7 years
Int. Cl. D28—*99*
U.S. Cl. D87—10



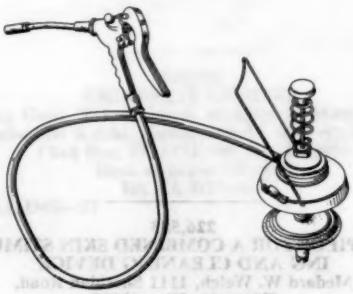
226,589
AUXILIARY MOTORCYCLE SEAT
Paul W. Svehla, 3985 La Cresenta Road, El Sobrante, Calif. 94803, and Samuel R. McQuisten, 933 Oxford St., Berkeley, Calif. 94707
Filed July 15, 1971, Ser. No. 163,130
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—16



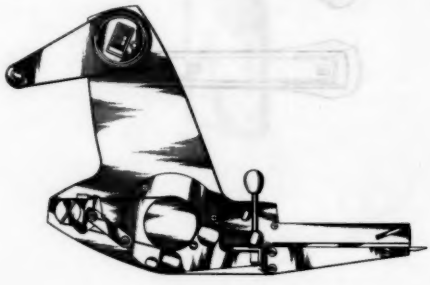
226,590
SHAVER
Hermann R. Schaefer, Bridgeport, Conn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed July 1, 1971, Ser. No. 26,567
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



226,591
GREASE APPLICATOR
Eric Le Cheminant, 47–49 Henderson St., Turrella, New South Wales, Australia
Filed Mar. 15, 1971, Ser. No. 124,635
Term of patent 7 years
Int. Cl. D8—*05*
U.S. Cl. D52—2 A

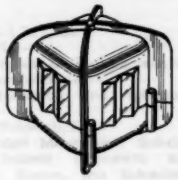


226,592
ADHESIVE LABEL DISPENSER
William L. Noack, Whittier, Calif., assignor to Avery Products Corporation, San Marino, Calif.
Filed Apr. 29, 1971, Ser. No. 138,855
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—2 C



226,593
PAIR OF SPECTACLES
Anthony Shindler, Brookline, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 14, 1970, Ser. No. 24,976
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

226,594
RAILROAD SWITCH REFLECTORIZED SEMAPHORE
William A. Teasel, 251 Strathmoor, and Wallace A. Stanley, 24665 Waldon Road E., both of Birmingham, Mich.
Filed Mar. 5, 1971, Ser. No. 121,610
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1 G



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MARCH, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aaland, Harold H.; and Ma, James L. Sulfur trioxide vapor for duct conditioning. 3,722,178, Cl. 55-4.000.

AB Hagglund & Soner: *See—*
Sjostrom, John Olov Hilding; and Sundkvist, Lars Erik, 3,722,720.

Abe, Hiroyuki: *See—*
Kosugi, Takashi; Abe, Hiroyuki; and Sudo, Hisao, 3,723,822.

Abex Corporation: *See—*
Coakley, James L., 3,723,025.

ACF Industries, Incorporated: *See—*
Holt, Jan D.; and Smith, Garth R., 3,722,429.

Ackermann, Hans; and Creutzburg, Gerhard, to Ciba-Geigy Corporation. Brighteners of the bis-s-triazinylaminostilbene series. 3,723,425, Cl. 260-240.00b.

Ackilli, Joseph Anthony: *See—*
Cahn, Arno; Ackilli, Joseph Anthony; and Carroll, Frank Emery, 3,723,356.

Acme-Cleveland Corporation: *See—*
Schubert, Karl P., 3,722,048.
Schubert, Karl P., 3,722,334.

Acraloc Corporation: *See—*
Worline, Paul W., 3,722,558.

Acushnet Company: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis Des., 3,722,887.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Bass tone producing device for an electronic musical instrument. 3,723,633, Cl. 84-1.010.

Adams, Charles De Witt: *See—*
Schlatter, Rudolph; and Adams, Charles De Witt, 3,723,505.

Adams, David K.; and Ho, Raymond Y.-C., to Stanford Research Institute. Multiple resonator active filter. 3,723,773, Cl. 307-295.000.

Adams, Frank H.: *See—*
Pharis, Joe M.; and Adams, Frank H., 3,723,302.

Adams, Frank S., to Procter & Gamble Company, The. Chloromethylation process. 3,723,548, Cl. 260-651.0ha.

Adams, Harold Elwood: *See—*
Kern, William John; Bouton, Thomas Chester; and Adams, Harold Elwood, 3,723,575.

Adams, Jack S.: *See—*
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,722,360.
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,927.
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,928.

Addmaster Corporation: *See—*
Clary, John G.; and Wirtz, Larry K., 3,723,673.

Addressograph-Multigraph Corporation: *See—*
Bass, Michel; and Pitman, Richard W., 3,722,651.
Mahoney, Donald T.; and Maul, John A., 3,722,405.

ADEC Corporation: *See—*
Barone, Larry F., Jr.; Patterson, Paul E.; and Shade, Ross A. (said Barone and said Shade assors. to), 3,723,987.

Adelman, Robert Leonard, to Du Pont de Nemours, E. I., and Company. Ethylene-vinyl acetate-allyl glycidyl ether terpolymer with polyvinyl chloride. 3,723,570, Cl. 260-836.000.

Adkinson, Fred H. Handgrip multiple switch assembly including rotatable handle and universal joy stick type control. 3,723,687, Cl. 200-157.000.

Adler, Robert; DeVries, Adrian J.; and Dias, Fleming, to Zenith Radio Corporation. Acoustic surface wave device. 3,723,915, Cl. 333-30.00r.

Adler, Robert, to Zenith Radio Corporation. Acoustic surface wave filters with reflection suppression. 3,723,919, Cl. 333-72.000.

Adlerwerke vorm. Heinrich Kleyer A.G.: *See—*
Wenderoth, Karl, 3,722,633.

AEG-Elotherm GmbH: *See—*
Seulen, Gerhard; and Reinke, Friedhelm, 3,723,198.

Aerojet-General Corporation: *See—*
King, Harry A., 3,722,355.
Rudy, Erwin, 3,723,104.

Aeronca, Inc.: *See—*
Van Orsdel, John R., 3,722,071.

Agfa-Gevaert: *See—*
Willems, Jozef Frans, 3,723,117.

Agfa-Gevaert Aktiengesellschaft: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.
Kisselmann, Willy; Rumpelein, Fritz; and Kope, Paul, 3,722,459.
Kremp, Rudolf; and Hennig, Fridolin, 3,722,828.
Kubitzek, Alfred; and Borowski, Kurt, 3,723,934.
Neudecker, Karl, 3,722,988.
Winkler, Alfred, 3,722,388.

Agfa-Gevaert N.V.: *See—*
Natens, Luc Yves; and De Gueldre, Jean Martha, 3,722,274.

Agishtein, Ernst Khaimovich: *See—*
Itin, Artur Markovich; and Agishtein, Ernst Khaimovich, 3,722,049.

Aglitsky, Vladimir Efimovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Agranat, Edward A., to Romicon, Inc., mesne. Filtration device. 3,722,694, Cl. 210-321.000.

Aidlin Automation, Inc.: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, 3,722,659.

Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, to Aidlin Automation, Inc. Apparatus for orienting and feeding bottles, or like articles. 3,722,659, Cl. 198-33.0ac.

Aidlin, Stephen H.: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, 3,722,659.

Air King Corporation: *See—*
Swimmer, James A.; and Harris, Martin, 3,722,838..

Air Products and Chemicals, Inc.: *See—*
Alexander, Warner; and McEvoy, James E., 3,723,352.
Flank, William H.; McEvoy, James E.; and Stuart, John R., 3,723,351.

Air Reduction Company, Incorporated: *See—*
Moore, George L., 3,723,629.

Aircheck, Inc.: *See—*
Schoenbrod, Michael P., 3,722,028.

Airco Inc.: *See—*
Hunt, Charles D. A., 3,723,098.
Hunt, Charles D'A., 3,723,101.
Lowe, James H. C., 3,723,102.
McMillan, Robert D., Jr., 3,722,506.
Moen, Walter B.; and Halfon, Albert, 3,722,179.
Poulsen, Stephen D., Jr., 3,723,081.

Airco, Inc., mesne: *See—*
McDermott, Richard L.; and Mueller, Scott A., 3,722,226.

Aircraft Instruments, Inc.: *See—*
Hernandez, Ralph, Jr., 3,723,963.

Aisin Seiki Kabushiki Kaisha: *See—*
Maekawa, Tadashi; Suzuki, Akira; and Haramura, Shigenori, 3,722,369.
Sakakibara, Naoji; Kawabata, Yasuhiro; and Tsukuba, Korehiko, 3,722,614.
Suzuki, Hideki, 3,722,368.
Torii, Tatsumi; and Miyajima, Haruo, 3,722,635.

Aiuola, Franco: *See—*
Maulini, Maurizio; Aiuola, Franco; and Rueff, Herbert, 3,722,175.

Ajikawa Iron Works & Construction Company Limited: *See—*
Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, 3,722,463.

Ajinomoto Co., Inc.: *See—*
Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, 3,723,249.

Akachi, Hisateru, 50% to Oki Densen Kabushiki Kaisha. Method for continuously manufacturing a communication cable. 3,722,203, Cl. 57-160.000.

Akashi, Akira: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.

Aktiebolaget Imo-Industri: *See—*
Montelius, Torsten, 3,723,027.

Aktiebolaget Vibro-Verken: *See—*
Tunneblom, Eskil, 3,722,381.

Aktiengesellschaft Brown, Boveri & Cie: *See—*
Meier, Eugen, 3,723,821.

Aktiengesellschaft Gebruder Loepfe: *See—*
Loepfe, Erich; Keller, Walter; and Zweifel, Karl, 3,723,933.

Akzona Incorporated: *See—*
Kersten, Hilde; Meyer, Gerhard; and Neuhaus, Clemens, 3,723,522.

Albery, Raymond L.: *See—*
Everest, Frank G.; and Albery, Raymond L., 3,723,002.

Albrecht, Werner, to Klockner-Werke AG. Connecting means. 3,722,846, Cl. 248-357.000.

Aldrop, Lanneau Frazier: *See—*
Lee, Roy Leon; and Aldrop, Lanneau Frazier, 3,722,956.

Alexander, John Briar, to South African Sugar Association. Method of preparing a sugar product for refining. 3,723,179, Cl. 127-63.000.

Alexander, Robert H.; and Ballard, Paul E., to GTE Sylvania Incorporated. Apparatus and method for producing four piece lead wire assemblies. 3,722,046, Cl. 29-25.190.

Alexander, Warner; and McEvoy, James E., to Air Products and Chemicals, Inc. Supported silver catalysts. 3,723,352, Cl. 252-454.000.

Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich. Containe for pneumatic conveyance of loads along a pipe conduit. 3,722,428, Cl. 105-365.000.

Alkaitis, Anthony; and Thomas, Gordon A., to Mooney Chemicals, Inc. Drying oil compositions, cobalt drier compositions therefor and process of making same. 3,723,152, Cl. 106-310.000.

Allais, Andre; and Girault, Pierre, to Roussel UCLAF. Method of killing undesired plants and insects. 3,723,091, Cl. 71-122.000.

Allen, Brian Robert, to Lucas, Joseph, (Industries) Limited. Intercell connection making in electric storage. 3,723,699, Cl. 219-78.000.

Allen, Colin James. Methods of sorting or selecting articles on a conveyor path and apparatus used therefor. 3,722,425, Cl. 104-88.000.

Allen, Gordon Y. R. Alarm circuit for monitoring the primary winding of a neutralizing transformer and its grounding connection. 3,723,813, Cl. 317-18.00b.

Allen, Irving; George, Edward T.; and Nordquist, Albert W., to Pratt-Read Corporation, mesne. Musical instrument keyboard construction. 3,722,351, Cl. 84-423.000.

Alles, Harold G.; and Nosler, John C. Electrical circuit for enabling the visual display of an audio signal by a conventional television receiver. 3,723,652, Cl. 179-1.0vs.

Allied Chemical Corporation: *See—*
Anello, Louis Gene; and Sweeney, Richard P., 3,723,507.
Barton, Oliver A., 3,723,332.
Byers, Robert D.; and Hartford, Winslow H., 3,723,261.
Khattab, Ghazi, 3,723,389.
Klingelhoefer, William Christian; and Sansing, James Earl, Jr., 3,723,606.
Litke, Alvin C., 3,723,056.

Allis-Chalmers Corporation: *See—*
Crooks, James W., 3,722,300.
Crooks, James W., 3,722,301.
Matthews, Dean A., 3,722,723.
Matthews, Ralph W.; and Semeniak, Nicholas W., 3,722,542.

Allis-Chalmers Manufacturing Company: *See—*
Peterson, Donald E., 3,722,598.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Andersson, Anders R.; and Bjorklund, Anders, 3,723,797.
Lee, Lars; Gavlefors, Sture; and Eriksson, Olle, 3,723,247.

Altar, William; and Helstrom, Carl W., Jr., to United States of America, Navy. Homing missile steering system. 3,722,447, Cl. 114-23.000.

Alten, Ralph W., to Essex International, Inc. Electromagnetic relay. 3,723,925, Cl. 335-187.000.

Altherr, Russell George: *See—*
Ion, Forrest Fothergill; Polanin, Walter Richard; and Altherr, Russell George, 3,722,708.

Althouse, Harlan E.; Scott, Fremont L.; and Cole, Gordon E., Jr., to M & T Chemicals Inc. Vinyl dispersion textured coating. 3,723,379, Cl. 260-31.80m.

Aluminum Company of America: *See—*
Van Greuingen, Theodore A., 3,722,280.

Alvarez, Joseph A.; and Barner, Robert P., Jr., to International Business Machines Corporation. Memory system with logical and real addressing. 3,723,976, Cl. 340-172.500.

Alza Corporation: *See—*
Andersen, Niels H.; and Weinshenker, Ned M., 3,723,423.

Amana Refrigeration, Inc.: *See—*
Bourgeois, Joseph F., 3,722,031.

Amazon Natural Drug Company: *See—*
Persinos, Georgia J., 3,723,410.

Ambler, E. Curtis; Scoville, Andrew E.; and Bush, Walter R., to Stanley Works, The. Electronic circuit protective device. 3,723,815, Cl. 317-18.00d.

American Cyanamid Company: *See—*
Lies, Thomas Andrew; and Clapp, James Wellington, 3,723,494.
Los, Marinus, 3,723,533.
Lucas, Howard Robert, 3,723,373.
Parekh, Girish Girdhar; and Blank, Werner Josef, 3,723,374.
Song, John, 3,723,428.
Susi, Peter Vincent, 3,723,427.

American Home Products Corporation: *See—*
Wiesner, Karel, 3,723,437.

American Hospital Supply Corporation: *See—*
Kennedy, Eugene R., 3,722,789.

American Lava Corporation: *See—*
Theobald, Paul R.; and Bailey, Joseph T., 3,723,176.

American Pulverizer Company: *See—*
Strom, Sven B., 3,722,805.

Amiard, Yves; Bellissent, Jean-Paul; and Marie, Gilbert, to Societe Nationale des Petroles D'Aquitaine. Copolymers of olefins or olefins and non-conjugated dienes with norbornene derivatives. 3,723,399, Cl. 260-80.730.

Amoco Production Company: *See—*
Froning, H. R.; Raza, Syed H.; and Askew, Warren S., 3,722,590.
Lummus, James L.; and Edwards, Carl D., 3,723,311.

Ampex Corporation: *See—*
Lienhard, Heinz, 3,723,983.
Ritchey, Thomas W., Jr., 3,723,668.

Amrhein, Heinz G.; Stander, Herman; and Rosenow, Heinz, to Wendt, Fritz, KG. Machine for grinding of workpieces. 3,722,145, Cl. 51-56.000.

Amsted Industries Incorporated: *See—*
Ion, Forrest Fothergill; Polanin, Walter Richard; and Altherr, Russell George, 3,722,708.

Anchor Hocking Corporation: *See—*
Probasco, Charles W., 3,722,665.

Anderberg, A. W., Manufacturing Co.: *See—*
Anderberg, Axel W.; and Taylor, George A., 3,722,142.

Anderberg, Axel W.; and Taylor, George A., to Anderberg, A. W., Manufacturing Co. Mounting bracket for overhead window. 3,722,142, Cl. 49-248.000.

Andersen, Christian Karmark: *See—*
Peill, Jurgen Eberhardt; Gerritse, Alf; Osmera, Miroslav S.; and Andersen, Christian Karmark, 3,722,396.

Andersen, Niels H.; and Weinshenker, Ned M., to Alza Corporation. Novel alkoxyt etrahydropyranyl ethers of prostaglandins. 3,723,423, Cl. 260-240.00r.

Anderson, Colin C. Fencing. 3,722,861, Cl. 254-64.000.

Anderson, Gail A.: *See—*
Wyatt, Gerald A.; and Anderson, Gail A., 3,723,948.

Anderson, Greenwood & Co.: *See—*
Powell, Walter W.; and Howland, Dennis L., 3,722,852.

Anderson, John R.; and Perron, James S., to United Aircraft Corporation. Process of making magnesium oxide cores. 3,722,574, Cl. 164-41.000.

Anderson, Leroy E.; and Munn, Gerald J., to Manufacturers Systems, Inc., mesne. Method of forming a rectangular heat duct. 3,722,443, Cl. 113-54.000.

Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., to Sandoz Wander, Inc. 3-Substituted amino-6-hydrazino pyridazines as hypotensives. 3,723,620, Cl. 424-250.000.

Anderson, Robert O.: *See—*
Cichy, Paul; and Anderson, Robert O., 3,723,631.

Anderson, Robert P., to Corning Glass Works. Method for terminating an electrical component. 3,723,590, Cl. 264-104.000.

Andersson, Anders R.; and Bjorklund, Anders, to Allmanna Svenska Elektriska Aktiebolaget. Insulated coil for arrangement in a slot in the stator or rotor of an electrical machine. 3,723,797, Cl. 310-196.000.

Andresen, Otto: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,723,250.

Andrews, George J.; and Rosen, Harold A., to Hughes Aircraft Company. Spin stabilized vehicle and solar cell arrangement therefor. 3,722,840, Cl. 244-1.0ss.

Anello, Louis Gene; and Sweeney, Richard P., to Allied Chemical Corporation. Perfluoro cycloalkyl acrylates. 3,723,507, Cl. 260-486.00h.

Anglo American Corporation of South Africa Limited: *See—*
Moore, Victor J., 3,722,869.

Anonima Castelli S.a.S.: *See—*
Piretti, Giancarlo, 3,722,704.

Antholzner, Heinrich: *See—*
Utz, Kastulus; and Antholzner, Heinrich, 3,723,168.

Ao, Hideki: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,723,442.

Aplet, Everett Lloyd; and Reynolds, Thomas J., to Western Gear Corporation. Tension control system. 3,722,769, Cl. 226-25.000.

Aplin, Neville Frederick. Hydraulic wheel motor unit. 3,722,370, Cl. 91-506.000.

Apotheker, David; and Van Gulick, Norman M., to Du Pont de Nemours, E. I., and Company. Coordination catalyst. 3,723,348, Cl. 252-429.00b.

Appleton, Arthur I. Safety mounted explosion proof light fixture. 3,723,724, Cl. 240-11.20e.

Applied Power Industries, Inc.: *See—*
Clark, Raymond; and Knutson, Dale A., 3,722,367.

Aqua Therm Products Corporation: *See—*
Tobinick, Sidney; and Semenoff, Arnold, 3,722,012.

Arai, Atsuaki: *See—*
Iwano, Haruhiko; Tanaka, Mitsugu; Otsuki, Tetsuo; and Arai, Atsuaki, 3,723,118.

Arakawa, Tsuneaki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle fuel tank. 3,722,529, Cl. 137-266.000.

Aranguren, Jorge; and Stansel, John C., to TRW Inc. Radioisotope capsule protection structure. 3,723,742, Cl. 250-106.000.

Araya, Kenji; Enomoto, Akihiro; Nishina, Akira; and Yamaguchi, Masahiro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, mesne. Method of and apparatus for injecting fuel into a diesel engine. 3,722,490, Cl. 123-179.001.

Arbeitsstelle fur Molekularelektronik: *See—*
Schmiedecke, Werner, 3,723,277.

Architectural Partitions: *See—*
Satkin, David M.; Helvie, Gene B.; and Tillotson, Charles J., 3,722,163.

Architectural Pottery: *See—*
Deeds, Douglas; and Rosengrant, Barry L., 3,722,972.

Arias, Alan. Ignition key alarm. 3,723,677, Cl. 200-44.000.

Arie, Ryosuke: *See—*
Uchiyama, Yoshihiro; Nakano, Yoshiyuki; Kishigami, Takashi; and Arie, Ryosuke, 3,723,018.

Arimoto, Masahiro: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.
Arimura, Katsuo: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,723,442.
Arimura, Kunitaka. High speed vehicle for traveling on water. 3,722,450, Cl. 114-665.00h.
Arisara Investment Corporation NV: *See—*
Peillex, Pau, 3,721,995.
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of 1-methyl-3-phenylindans. 3,723,555, Cl. 260-668.00f.
Armour and Company: *See—*
Baccetti, Valerio A., 3,722,034.
Armour-Dial, Inc.: *See—*
Steinhauer, Roger C.; Falevitch, Leonard A.; and Church, David R., 3,723,376.
Armstrong Cork Company: *See—*
Nute, Ernest B., Jr., 3,722,933.
Armstrong, Edward T. Reinforces sheet material and method for making the same. 3,723,235, Cl. 161-140.000.
Armstrong, Robert T., to Southwire Company. Method of cooling and drying a wire utilizing an induced air wipe. 3,722,077, Cl. 29-527.400.
Arneklev, Duane R.: *See—*
Teach, Eugene G.; and Arneklev, Duane R., 3,723,474.
Arnett, Wayne E.; and Solomon, Cyril P., to Solarn Mfg., Co., Inc. Pond filter. 3,722,686, Cl. 210-170.000.
Arnold, Richard B., to General Electric Company. Apparatus for inserting insulators and coil turns into the slots of a magnetic core. 3,722,063, Cl. 29-205.00r.
Arnoldussen, Theodorus Franciscus, to U.S. Philips Corporation. Cassette. 3,722,829, Cl. 242-199.000.
Arntz, Frederich Otto Wilhelm; and Walton, Geurney Elden. Pipe clamping device. 3,722,038, Cl. 24-81.0pe.
Aronoff, Samuel. Voting system. 3,722,793, Cl. 235-50.00a.
Arrow Pneumatics, Inc.: *See—*
Fiedler, Martin, 3,722,583.
Arrow-Hart, Inc.: *See—*
Dennison, John J., 3,723,942.
Schleicher, Harold E., 3,723,939.
Arrowhead Engineering Corporation: *See—*
Shaffer, S. Ralph, 3,722,309.
Art Iron, Inc.: *See—*
Schlatter, Benjamin G.; and Spate, Sydney, 3,722,152.
Artos Dr.-Ing. Meier-Windhorst Kommanditgesellschaft: *See—*
Meier Windhorst, Christian August, 3,722,233.
Asahi Giken Kabushiki Kaisha: *See—*
Hirata, Hiroshi; and Toyoda, Hiroshi, 3,722,600.
Asahi Glass Company, Ltd.: *See—*
Kato, Shigeki; and Yamamoto, Takeshi, 3,723,142.
Ono, Isao, 3,723,593.
Asahi Shimbun Publishing Company: *See—*
Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, 3,723,645.
Ashenden, Edward A.: *See—*
Seiple, Ronald L.; Ashenden, Edward A.; and Webb, Robert L., 3,722,941.
Ashland Oil, Inc.: *See—*
Carpenter, Robert E.; and Peterson, Curtis R., 3,723,390.
Askew, Warren S.: *See—*
Froning, H. R.; Raza, Syed H.; and Askew, Warren S., 3,722,590.
Asou, Setsuro; Sugawara, Junichi; Tanso, Tukuhei; and Yashiro, Katsuji, to Otsukakoki Kabushiki Kaisha. Parking brake operator lever. 3,722,318, Cl. 74-535.000.
Asplin, William. Modular filters for television receivers. 3,723,884, Cl. 325-477.000.
Associated Electrical Industries Limited: *See—*
Banner, Aubrey E.; and Merren, Thomas O., 3,723,713.
Astrup Company, The: *See—*
Knight, John D.; and Darula, Andrew J., 3,722,571.
Atchley, Richard C., to Hoover Ball and Bearing Company. Conveyor mechanism for article dispensing apparatus. 3,722,743, Cl. 221-77.000.
Atkins, Carl E.; and Carlson, Paul A., to Wagner Electric Corporation. Induction-keyed door-lock and power control circuit for automotive vehicles and the like. 3,723,967, Cl. 340-63.000.
Atkins, Vern A., Sr. Hook-setting fishing rod holder. 3,722,127, Cl. 43-15.000.
Atlantic Richfield Company: *See—*
Bucaram, Salim M.; and Mortimer, Alfred L., 3,722,592.
Faulk, Joseph H., 3,722,608.
Kern, Loyd R.; and Striegler, John H., 3,722,609.
Atlas Copco Aktiebolag: *See—*
Henningsson, Karl Gosta, 3,722,526.
Augstein, Joachim; Ham, Allan L.; Leeming, Peter R.; and Snarey, Michael, to Pfizer Inc. Polar-substituted propanolamines as anti-angina and anti-hypertensive agents. 3,723,524, Cl. 260-559.00s.
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, to Novo Terapeitisk Laboratorium A/S. Proteolytic enzymes, their production and use. 3,723,250, Cl. 195-62.000.
Aupoix, Marcel; and Moisson-Franckhauser, Francois, to Compagnie Generale d'Electricite and L'Air Liquide, Societe Anonyme pour l'Etude et l'Expolotation des Procedes Georges. Cryogenic cable and process for making the same. 3,723,634, Cl. 174-15.00c.
Aust, Karoly: *See—*
Ziemek, Gerhard; Schatz, Friedrich; and Aust, Karoly, 3,722,777.
Automatic Sprinkler Corporation: *See—*
Sievenpiper, Ward, 3,722,375.
Automobiles Peugeot: *See—*
Chopin, Jean; and Eloy, Jacques, 3,722,221.
Rivere, Jean-Pierre, 3,722,486.
Ventre, Pierre, 3,722,027.
Avco Corporation: *See—*
Leonard, Donald A., 3,723,007.
McClure, John W., 3,722,638.
Rogers, Cedric G., 3,723,831.
Stein, Wolfgang J., 3,722,212.
Stiff, Bernard G.; and Finelli, Thomas M., 3,722,051.
Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See—*
Maulini, Maurizio; Aiuola, Franco; and Rueff, Herbert, 3,722,175.
B. C. Gearworks Ltd.: *See—*
Hrescak, Stan, 3,722,827.
Baade, Kurt. Drain fitting for a bath tub. 3,722,692, Cl. 210-314.000.
Babcock & Wilcox Company, The: *See—*
McIlroy, Robert A.; Sage, Warnie L.; and Markant, Henry P., 3,723,068.
Baccetti, Valerio A., to Armour and Company. Cut-off device for forming apparatus. 3,722,034, Cl. 17-32.000.
Bachman, Gustave Bryant; and Maleski, Robert Joseph, to Purdue Research Foundation. Selective production of nitro alkanes. 3,723,546, Cl. 260-644.000.
Bachmeier, Alfred, to Licentia, Patent-Verwaltungs-G.m.b.H. Zener diode and method of producing such a zener diode. 3,723,832, Cl. 317-234.00r.
Backhouse, Margaret Peddie; Topham, Arthur; and Tury, Bernard, to Imperial Chemical Industries Limited. Dispersing agents. 3,723,151, Cl. 106-308.00q.
Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, 3,723,555.
Beer, Ludwig; Fischer, Hermann; and Heil, Eduard, 3,723,391.
Buddrus, Joachim, 3,723,537.
Goetze, Walter; Wolf, Peter; Schulz, Gerhard; and Luedemann, Horst, 3,723,530.
Matthias, Guenther; Kasper, Werner; and Schulz, Gerhard, 3,723,509.
Nagel, Otto; Platz, Rolf; and Fuchs, Werner, 3,723,545.
Schuhmacher, Alfred, 3,723,479.
Schuster, Ludwig; and Oster, Rudolf, 3,723,541.
Stuebinger, Adolf; and Mueller, Herbert, 3,723,536.
Baer, Stephen C., to Zomeworks Corporation. Structural system. 3,722,153, Cl. 52-81.000.
Baermann, Max. Eddy-current and hysteresis brake for track-bound vehicles. 3,723,795, Cl. 310-93.000.
Bahnsen, Erwin B., to Steiner American Corporation. Continuous washing apparatus. 3,722,232, Cl. 68-3.0ss.
Bahr, Donald W.; and Harshman, Daniel L., to General Electric Company. Annular slot combustor. 3,722,216, Cl. 60-39.360.
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, to Sredneaziatsky Nauchno-Issledovatelsky i Proektny Institut Tsvetnoi Metallurgii. Method of producig high purity antimony from antomony trioxide obtained by burning refined metal. 3,723,267, Cl. 204-105.00r.
Bailey, George Terrell. Variable length trousers construction. 3,722,001, Cl. 2-269.000.
Bailey, Joseph T.: *See—*
Theobald, Paul R.; and Bailey, Joseph T., 3,723,176.
Bak, Harry B.: *See—*
Jackson, Richard H.; and Bak, Harry B., 3,722,102.
Baker, Arthur W. Fish basket support. 3,722,844, Cl. 248-302.000.
Baker, Bernard S.: *See—*
Borucka, Alina Z.; Marianowski, Leonard G.; and Baker, Bernard S., 3,723,186.
Baker, Don R., to Stauffer Chemical Company. Fungicidal and bactericidal compositions and method of killing bacteria and fungi using substituted bis (bromoacetoxy) xylenes. 3,723,626, Cl. 424-311.000.
Baker, John Gordon, to Baker Manufacturing Company. Pitless well adapter. 3,722,586, Cl. 166-85.000.
Baker Manufacturing Company: *See—*
Baker, John Gordon, 3,722,586.
Baker, Walter L.: *See—*
Kush, Louis J., Jr.; and Baker, Walter L., 3,723,951.
Bakewell, Sidney. Dough mixing machine. 3,722,834, Cl. 259-105.000.
Bakumenko, Sergei Panteleevich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.
Balac, Joseph F.: *See—*
Craig, Dwin Richardson, 3,722,980.
Balchunas, Anthony J.: *See—*
Miller, Robert E., Jr.; and Balchunas, Anthony J., 3,722,565.
Baldwin, D. H., Company: *See—*

Brean, John W., 3,722,984.
Ballantine Laboratories, Inc., mesne: *See*—
Duckworth, James J., 3,723,845.
Ballard, Paul E.: *See*—
Alexander, Robert H.; and Ballard, Paul E., 3,722,046.
Bally Manufacturing Corporation: *See*—
Brown, Richard L., 3,722,884.
Baltkajs, Yanis Yanovich: *See*—
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.
Balzers Patent- und Beteiligungs-Aktiengesellschaft: *See*—
Kraus, Thaddaus, 3,722,259.
Bando, Yoshichika: *See*—
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.
Baney, Ronald H., to Dow Corning Corporation. Silicone compositions catalyzed with platinum II diacetylacetonate. 3,723,497, Cl. 260-46.5ua.
Bangerter, Kenneth R.: *See*—
Hautaniemi, Bruno Wendell; Bowman, Robert A.; and Bangerter, Kenneth R., 3,722,263.
Banitt, Elden H.: *See*—
Robertson, Jerry E.; Harrington, Joseph Kenneth; and Banitt, Elden H., 3,722,599.
Banks, William L., Jr. Auxiliary hook stay. 3,722,451, Cl. 114-102.000.
Banner, Aubrey E.; and Merren, Thomas O., to Associated Electrical Industries Limited. Mass measurement system for mass spectrometers. 3,723,713, Cl. 235-151.350.
Barbee, Robert B.: *See*—
Field, Lamar; and Barbee, Robert B., 3,723,513.
Barber, Gerald L. Helicopter type vehicle. 3,722,830, Cl. 244-17.230.
Barbezat, Pierre; and O'Murchu, Colm, to Lonza Ltd. Process for the production of cyanoacetic acid. 3,723,499, Cl. 260-465.400.
Bardell, Paul H., to International Business Machines Corporation. Resistor bed structure for monolithic memory. 3,723,837, Cl. 317-235.00r.
Barker, Ricard G., to Union Camp Corporation. Oxidation of sulfide pulping liquor to form polysulfide liquor in situ. 3,723,242, Cl. 162-38.000.
Barner, Robert P., Jr.: *See*—
Alvarez, Joseph A.; and Barner, Robert P., Jr., 3,723,976.
Barnes, Dwaine R., to Caterpillar Tractor Company. Bearing service tool. 3,722,057, Cl. 29-200.00d.
Barnes, George John Preston, to International Standard Electric Corporation. AGC circuit to maintain amplification at a fixed level between speech bursts. 3,723,897, Cl. 330-29.000.
Barone, Bruno J.; and Croce, Louis J., to Petro-Tex Chamical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,723,515, Cl. 260-523.00a.
Barone, Bruno J.; and Croce, Louis J., to Petro-Tex Chamical Corporation. Promotion of the oxidation of mononuclear aromatic compounds. 3,723,518, Cl. 260-524.00r.
Barone, Larry F., Jr.; Patterson, Paul E.; and Shade, Ross A., said Patterson assor. to Mobil Oil Corporation and said Barone and said Shade assors. to ADEC Corporation. Method and apparatus for monitoring fluid flow systems. 3,723,987, Cl. 340-242.000.
Barozzi, Gian Piero; and Horeschi, Giancarlo, to Citizen Watch Co., Ltd. Division control mechanism. 3,722,795, Cl. 235-62.00f.
Barrineau, Wade H.; and Osborne, Anthony, to Southern Cross Industries, Inc. Ladder rack. 3,722,766, Cl. 224-42.10f.
Bartholomew, Paul E., to Caterpillar Tractor Company. Flexible airfoil for compressor. 3,723,021, Cl. 415-147.000.
Bartilson, Benjamin M., to United States of America, Army. Wire tying apparatus including timing and stopping mechanism. 3,722,553, Cl. 140-93.00a.
Bartley, Thomas S.; and Wagenknecht, Paul A., to International Paper Company. Foam header assembly. 3,722,469, Cl. 118-414.000.
Barton, Oliver A., to Allied Chemical Corporation. Stabilized perchlorofluorocarbon compositions. 3,723,332, Cl. 252-171.000.
BASF Wyandotte Corporation: *See*—
Davis, Pauls; and Vogt, Herwart C., 3,723,404.
Kan, Peter T., 3,723,366.
Baskin, Arnold M. Sorting of differently classified sheets. 3,722,675, Cl. 209-80.500.
Bass, Gerald R.: *See*—
Kienle, Raymond P.; Bass, Gerald R.; Deegan, James J.; and Kiwiets, Johannes, 3,722,657.
Bass, Michel; and Pitman, Richard W., to Addressograph-Multigraph Corporation. Keyboard. 3,722,651, Cl. 197-16.000.
Batey, Robert W.; and Welte, Theodore J. R., to International Telephone and Telegraph Corporation. On-line electronic moisture analysis system. 3,723,865, Cl. 324-61.00r.
Battelle Development Corporation: *See*—
Johnson, Harry T.; and Mitchell, Robert K., 3,723,034.
Battigelli, Jean, to Saint-Gobain, mesne. Low density polystyrene pearls and methods of making them. 3,723,362, Cl. 260-2.50b.
Baudelet de Livois, Guy M., to Controle Bailey (Societe Anonyme). Control network for burning fuel oil and gases with reduced excess air. 3,723,047, Cl. 431-76.000.
Bauer, Charles A.; and Floyd, Alfred E., to Sargent and Company. Emergency exit door unlatching actuator. 3,722,938, Cl. 292-92.000.
Bauer, Dale M.: *See*—
Stewart, Andrew W.; Britzman, Gilbert J.; Bauer, Dale M.; and Britzman, Bruce E., 3,722,816.
Bauer, Jackson, to Collins and Aikman Corporation. Method of producing bonded textile fabrics with improved dimensional stability. 3,723,217, Cl. 156-164.000.
Bauer, Ronald S.; and Holler, Howard V., to Shell Oil Company. Process for making articles from SO_2-conjugated diolefin-cyclopentadiene polymer. 3,723,591, Cl. 264-237.000.
Baugh, Benton F.: *See*—
Nelson, Bobby H.; and Baugh, Benton F., 3,722,585.
Baughman, Davis Lee: *See*—
Ixer, Bernard W.; and Baughman, Davis Lee, 3,722,710.
Baur, Hans. Load bearing strap. 3,722,942, Cl. 294-74.000.
Baxter Laboratories, Inc.: *See*—
Cromie, Harry W., 3,722,004.
Huggins, James A., 3,722,557.
Bayer Aktiengesellschaft: *See*—
Gunter, Gehrke; Hederich, Volker; Harms, Wolfgang; and Wagner, Peter, 3,723,480.
Hahnkamm, Volker; Broja, German; Brandle, Karl; and Elstermann, Calus-Heinrich, 3,723,611.
Konig, Klaus; Muller, Erwin; and Wagner, Kuno, 3,723,392.
Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, 3,723,609.
Moller, Friedrich; Roegler, Manfred; Simmler, Walter; and De Montigny, Armand, 3,723,492.
Yamada, Yasuo, 3,723,618.
BBA Group Limited: *See*—
Lumb, John B.; and Leeds, Edwards, 3,723,382.
Beach, Richard G.; Stultz, Harry, Jr.; and Symonds, James A., to Sybron Corporation. Differential pressure responsive device of welded construction. 3,722,373, Cl. 92-97.000.
Beall, George H.; and Rittler, Hermann L., to Corning Glass Works. Glass-ceramics containing pollucite. 3,723,140, Cl. 106-39.0dv.
Beasom, James D., to Radiation Incorporated. Process for forming buried layers to reduce collector resistance in top contact transistors. 3,722,079, Cl. 29-578.000.
Beatrice Foods Co.: *See*—
Binding, Kenneth W., 3,722,765.
Beavers, Bobby R., to LTV Altec, Inc. Directional loudspeaker system. 3,722,616, Cl. 181-31.00b.
Becker, Charles A.: *See*—
Rickrode, Cyril J.; and Becker, Charles A., 3,722,144.
Becker, John G.: *See*—
Stebbins, George B.; Stebbins, James F.; and Becker, John G., 3,722,687.
Beckman Instruments, Inc.: *See*—
Sloane, Howard J., 3,722,977.
Sloane, Howard J.; and Keahl, Gerald T., 3,722,978.
Wright, Herschel E., 3,722,791.
Bedwell, Thomas Albert; and McWhirt, Bobby Dwayne, to Hesston Corporation. Structure for varying relative positions of conveyors. 3,722,673, Cl. 209-73.000.
Beecham Group Limited: *See*—
Mamalis, Patrick; and Outred, Dennis J., 3,723,429.
Beeley, Michael G.; and Thompson, Richard D., to McGraw-Edison Company. Garment press head safety control. 3,722,116, Cl. 38-27.000.
Beer, Egon. Automated track-guided material handling system with electrical pulse programming. 3,722,426, Cl. 104-88.000.
Beer, Ludwig; Fischer, Hermann; and Heil, Eduard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Continuous manufacture of polyesters. 3,723,391, Cl. 260-75.00m.
Beese, Norman C.; and Malloy, James J., Jr., to International Telephone and Telegraph Corporation. Gaseous discharge high intensity lamp with fluid cooled electrode. 3,723,783, Cl. 313-32.000.
Behane, David; Spradley, Lewis Harold; Cahill, Lysle D.; and Marshall, William W., to Mead Corporation, The. Apparatus for reconstruction of images. 3,723,646, Cl. 178-66.00r.
Beier, Helmut: *See*—
Thurk, Gerhard; and Beier, Helmut, 3,723,685.
Beilin, Solomon Isaakovich: *See*—
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra,3,723,400.
Beiswanger, John P. G.: *See*—
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,723,578.
Beizerov, Semen Moiseevich. Water cooling system for vacuum arc furnace. 3,723,632, Cl. 13-32.000.
Bekhli, Jury Georgievich: *See*—
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.
Bell & Howell Company: *See*—
Ferrari, Leonard A., 3,723,666.
Haake, Robert, 3,722,892.
John, Robert S., Jr., 3,723,647.
Petterec, Robert E., 3,722,771.
Bell, Alan; and Jackson, Winston J., Jr., to Eastman Kodak Company. Phenoxyphthalate polyesters. 3,723,388, Cl. 260-47.00c.

Bell Canada-Northern Electric Research Limited: *See—*
Ebrahimi, Jalal, 3,723,760.
Lukas, Helmut Hans, 3,722,092.

Bell Telephone Laboratories, Incorporated: *See—*
Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, 3,723,716.
Brandle, Charles David, Jr.; and Miller, David Christopher, 3,723,599.
Bunce, Michael Kelly; Bush, Stanley Edward; Fargo, George Arthur, Jr.; and Saltus, George Edwin, 3,723,654.
Condon, Joseph Henry, 3,723,909.
Dellecker, Raymond Whyte; Greason, William Wallace, III; Hayden, Paul Ross; and Weiner, David William, 3,723,661.
Haskell, Barin Geoffry; and Limb, John Ormond, 3,723,644.
Jaeger, Raymond E.; and Nickell, Robert Ernest, 3,722,821.
Kaplan, Martin Louis; and Kelleher, Paul Goggin, 3,723,405.
Krupp, Roy Stephen; and Tomko, Lawrence Andrew, 3,723,985.
Lim, Yen San; and Subramanian, Mahadevan, 3,723,744.
Miller, Ralph La Rue, 3,723,877.
Nakada, Yoshinao; and Thomas, David Gilbert, 3,723,690.
Oberst, James Francis, 3,723,889.
Paoli, Thomas Lee; and Ripper, Jose Ellis, 3,723,903.
Patel, Chandra K. N., 3,723,902.
Pinnow, Douglas A.; and Van Uitert, Le Grand Gerard, 3,722,981.
Rowe, Harrison Edward; and Young, Dale Travis, 3,723,921.
Sauer, Harold Alfred, 3,722,581.
Seidel, Harold, 3,723,913.
Thatch, Raymond Allen, 3,723,912.
Udovic, Daniel John, 3,723,763.

Bellissent, Jean-Paul: *See—*
Amiard, Yves; Bellissent, Jean-Paul; and Marie, Gilbert, 3,723,399.

Bende, Albert J.; and Defalco, Ralph L., to Gindy Manufacturing Corporation. Hold-in transfer apparatus. 3,722,054, Cl. 29-200.00j.

Bendix Corporation, The: *See—*
Better, Bernard R.; and Hain, Edward, 3,722,312.
Hurlburt, Charles E.; and Lanni, Michael J., 3,722,296.
Jackson, Harold W.; Olmstead, Merlin E.; and Fickenscher, William E., 3,723,714.
Kautz, Robert F.; and Bourgeault, Leo B., 3,723,765.
Knight, Theodore L.; and Emery, Raymen F., 3,722,299.
Mueller, Rolf K.; and Wolber, William G., 3,723,966.
Raupp, Ray J., 3,722,535.
Tewksbury, John Merle, 3,723,898.

Benenati, Robert L., to GTE Sylvania Incorporated. Automatic gain control circuit. 3,723,894, Cl. 330-29.000.

Benesovsky, Friedrich, to Schwarzkopf Development Corporation. Sintered tungsten-boron alloy. 3,723,076, Cl. 29-182.000.

Benjamin, John Stanwood: *See—*
Cairns, Robert Lacock; and Benjamin, John Stanwood, 3,723,109.

Benjamin, John Stanwood, to International Nickel Company, Inc., The. Composite metal powder and production thereof. 3,723,092, Cl. 75-.50r.

Bennett, Malvin. Means for loading and unloading a camper. 3,722,721, Cl. 214-515.000.

Bentley, Charles A. Deck structure and connector for demountable parking building, or the like. 3,722,160, Cl. 52-278.000.

Berg Electronics, Inc.: *See—*
Berg, Quentin, 3,722,087.

Berg, Quentin, to Berg Electronics, Inc. Method and apparatus for mounting terminals on a circuit board. 3,722,087, Cl. 29-626.000.

Berger, Julius, to Hoffman-La Roche, Inc. Process for preparing an antibiotic substance which comprised fermenting the organism streptomyces hazeliensis. 3,723,254, Cl. 195-80.000.

Bergevin, Jean Paul; and Kuester, Karl Otto, to Du Pont of Canada, Limited. Packaging of liquid-filled flexible pouches in thermoplastic bags. 3,722,174, Cl. 53-182.000.

Bergey, John M., to HMW Industries, Inc. Self-illuminated liquid crystal timepiece. 3,722,206, Cl. 58-50.00r.

Berkin, Harvey: *See—*
Thorn, Herbert; and Berkin, Harvey, 3,722,136.

Berkowitz, Murray, to Curtiss-Wright Corporation. Rotary combustion engine with improved firing channel. 3,722,480, Cl. 123-8.010.

Berman, Merril, to Worthington Corporation. Means to overcome low flow problems of inducers in centrifugal pumps. 3,723,019, Cl. 415-53.000.

Bernath, Stanley. Electrical convertor means and circuit. 3,723,757, Cl. 307-114.000.

Bernier, Robert V., to TRW Inc. Film mount and mask for a pair of panoramic stereoscopic images. 3,723,904, Cl. 40-152.000.

Bernstein, Jack: *See—*
Yale, Harry L.; and Bernstein, Jack, 3,723,463.

Berrer, Dagmar; and Vogel, Christian, to Ciba-Geigy Corporation. Herbicidal compositions and methods. 3,723,088, Cl. 71-93.000.

Berry, Robert E.; and Wagner, Charles J., Jr., to United States of America, Agriculture. Method of preparing a dehydrated deacidified citrus juice product. 3,723,133, Cl. 99-105.000.

Berry, Robert F.; and Blackwell, Henry W., to Dresser Industries, Inc. Method of making well pressure sealing cup reinforcing structure. 3,722,053, Cl. 29-163.500.

Bertagni, Jose Juan. Flat diaphragm for sound transducers. 3,722,617, Cl. 181-32.00r.

Bessho, Yoshio: *See—*
Igarashi, Yoshikazu; Bessho, Yoshio; Kiroku, Yoshikazu; and Takahashi, Yasuo, 3,722,440.

Besson, Jean R.; and Boillot, Jean R., to Office Nationale d'Etudes et de Recherches Aerospatiales. System for measuring time difference between and synchronizing precision clocks. 3,722,258, Cl. 73-6.000.

Best, John S., to Dow Chemical Company, The. Insulated trafficked surfaces. 3,722,378, Cl. 94-4.000.

Besuner, Sidney; and Pardun, Richard L. Multiple liquid sample collection apparatus. 3,722,502, Cl. 128-2.00f.

Better, Bernard R.; and Hain, Edward, to Bendix Corporation, The. Method and nut for preloading ball screw assemblies and method of manufacture of the preload nut member. 3,722,312, Cl. 74-459.000.

Betts, William K.; and Sawtschenko, Alexander P., to International Business Machines Corporation. Serial loop communications system. 3,723,971, Cl. 340-163.00r.

Beyerlein, Fritz W., to Signetics Corporation. Alignment and bonding method for semiconductor components. 3,722,072, Cl. 29-471.300.

Beyl, Volker: *See—*
Niederprum, Hans; Voss, Peter; and Beyl, Volker, 3,723,512.

Bhattacharyya, Ranendra Kumar, to Western Electric Company, Incorporated. Methods and apparatus for trimming thin-film devices to value by means of a computer-controlled anodization process. 3,723,257, Cl. 204-15.000.

Bialas, Horst; and Lindenthal, Friedrich, to Dierks & Sohne. Mixing machines. 3,722,831, Cl. 259-6.000.

Bilz, Otto; and Fauth, Otto, to Bilz, Otto, Firma. Drilling chuck. 3,723,017, Cl. 408-16.000.

Bilz, Otto, Firma: *See—*
Bilz, Otto; and Fauth, Otto, 3,723,017.

Binding, Kenneth W., to Beatrice Foods Co. Car top rack. 3,722,765, Cl. 224-42.10e.

Biomarine Industries: *See—*
Parker, Frederick A., 3,722,510.

Birk, Donald G.: *See—*
Rodriguez, Leopoldo; and Birk, Donald G., 3,722,146.

Birkenstock, Karl. Article of footwear. 3,722,113, Cl. 36-11.500.

Bischoff Chemical Corporation: *See—*
Nussbaum, Frank J., 3,723,584.

Bisciglia, Natale R., to North American Rockwell Corporation. Control fold liquid expulsion bladder. 3,722,751, Cl. 222-94.000.

Bishop, Thomas H.: *See—*
Wheaton, Harold L.; and Bishop, Thomas H., 3,723,097.

Bissett-Berman Corporation, The: *See—*
Kennedy, John H., 3,723,589.

Bissinger, William E.; Hardiss, Donald E.; and Lavanish, Jerome M., to PPG Industries, Inc. Polychloro parathio phenols. 3,723,538, Cl. 260-609.00f.

Bitumarin N.V.: *See—*
Rinkel, Gerardus, 3,722,222.

Bixby, Douglas G.; and Helmke, Kenneth L., to Quaker Oats Company, The. Preparation of ready-to-eat peanut butter containing cereal. 3,723,131, Cl. 99-83.000.

Bjorklund, Anders: *See—*
Andersson, Anders R.; and Bjorklund, Anders, 3,723,797.

Bjornsen, Melvin G. Combined coupling and sealing adapter. 3,722,924, Cl. 285-55.000.

Black Clawson Company, The: *See—*
Seifert, Peter, 3,722,832.

Black, Sivalls & Bryson, Inc.: *See—*
McMinn, Robert E., 3,722,184.

Blackstone Corporation: *See—*
Douglas, Peyton W., 3,722,234.

Blackstone, James O., Jr.: *See—*
Strother, Fred P.; and Blackstone, James O., Jr., 3,722,434.

Blackwell, Henry W.: *See—*
Berry, Robert F.; and Blackwell, Henry W., 3,722,053.

Blackwell, Henry Wayne, to Dresser Industries, Inc. Gas lift valve apparatus. 3,722,527, Cl. 137-155.000.

Blair, Calvin B. Self-propelled bale handling apparatus. 3,722,722, Cl. 214-522.000.

Blair Manufacturing Co.: *See—*
Harnick, Robert, 3,722,950.

Blakely, Richard P., to Case, J. I., Company. Load carrying device with improved position control. 3,722,724, Cl. 214-776.000.

Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., to General Dynamics Corporation. Measuring and locating method. 3,722,360, Cl. 90-11.00c.

Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., to General Dynamics Corporation. Magnetic holding means in a surface plate dimensional measuring apparatus. 3,723,927, Cl. 335-285.000.

Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., to General Dynamic Corporation. Magnetically held measuring and locating fixtures. 3,723,928, Cl. 335-285.000.

Blanc, Bernard: *See—*
Gibier-Rambaud, Alain; and Blanc, Bernard, 3,723,394.

Blandin Paper Company: *See—*
Guastella, Samuel L.; and Larrivee, Jerry J., Jr., 3,723,169.

Blank, Werner Josef: *See—*
Parekh, Girish Girdhar; and Blank, Werner Josef, 3,723,374.

Blary, Auguste, to Societe Anonyme Francaise Eternit. Apparatus for the production of asbestos-cement pipes. 3,723,245, Cl. 162-284.000.

Blasse, George; and DeVries, Jaap, to U.S. Phillips Corporation, mesne. Red luminescent europium activated yttrium oxychloride

phosphor and color television display tubes containing said phosphor. 3,723,787, Cl. 313-92.0ph.

Blau, Henry H., Jr., to Environmental Research & Technology, Inc. Absorption spectroscopy. 3,723,731, Cl. 250-43.50r.

Bletcher, James H.; and Rauh, Jack K., to Trust of Blecther, Ralph E.; deceased, 10%, 5% to Robertson, Frederick, 5% to Robertson, Gary, 10% to Bucknell, Lenora, 10% to Bletcher, Richard, Liston, Marcia, as trustee for, 5% to Liston, Daniel E., 5% to Listo, Carol A., 5% to Liston, James H., 10% to Brondum, Hazel, 10% to Bletcher, Pearl, 15% to Liston, Marcia and 10% to Bucknell, Ernest H. Combined aerator-spray assembly. 3,722,798, Cl. 239-428.500.

Bletcher, Pearl: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

Bletcher, Richard: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

Block, Philip L.; and Derdivanis, John P. Dental plaque disclosing agent. 3,723,613, Cl. 424-7.000.

Blonsky, Joseph E., to Westvaco Corporation. Weight-aligned grapple. 3,722,706, Cl. 212-55.000.

Blue Bird Body Company: *See—*
Rumph, Wilbur C.; and Ragan, William Leon, 3,722,303.

Blum, Alvin S., to Ohio Nuclear, Inc. Mouthpiece and filtering system. 3,722,511, Cl. 128-147.000.

Blumberg, Martin. Pill dispenser having clockwork for periodic dispensing. 3,722,739, Cl. 221-3.000.

Blumcraft of Pittsburgh: *See—*
Horgan, William J., Jr., 3,722,029.

Blumenfeld, Georg; Daum, Gerhard; and Richtzenhain, Hermann, to Dynamit Nobel Aktiengesellschaft. Ketonitriles and method for their production. 3,723,468, Cl. 260-340.700.

Blundell, Thomas: *See—*
Colchester, John Edward; and Blundell, Thomas, 3,723,444.

Bobear, William J., to General Electric Company. Ablative coating compositions. 3,723,481, Cl. 260-37.0sb.

Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, to Bell Telephone Laboratories, Incorporated. Single wall domain arrangement including fine-grained, field access pattern. 3,723,716, Cl. 235-176.000.

Bock, Helmuth-Joachim: *See—*
Gerke, Peter; Bock, Helmuth-Joachim; and Sennefelder, Anton, 3,723,660.

Bodine, Albert G. Grit pad cleaner. 3,722,149, Cl. 51-241.00s.

Boehmig, Robert L. Method of building construction. 3,722,169, Cl. 52-745.000.

Boehringer, C. H., Sohn: *See—*
Freter, Kurt; and Zeile, Karl, 3,723,440.
Ost, Walter; and Thomas, Klaus, 3,723,454.

Boettcher, Alfred; and Nickel, Hubertus, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of producing fuel and/or breeder elements for nuclear reactors. 3,723,581, Cl. 264-.500.

Bogart, Harold N.; Hopwood, Norman W., Jr.; Pearson, Archie A.; and Whitacre, Foster E., to Ford Motor Company. Incremental construction of three-dimensional objects having premachined rod elements and method for forming the same. 3,722,257, Cl. 72-475.000

Bogomolova, Ljubov Grigorievna: *See—*
Mikheev, Nikolai Borisovich; Gracheva, Maia Arkadievna; Bogomolova, Ljubov Grigorievna; and Levin, Valentin Ilich, 3,723,612.

Bohrer, Thomas Carl; Ecker, George Franklin; and Chen, David Hsiao Tsung, to Celanese Corporation. Hot stepwise drawing of polybenzimidazole strand material with independent free-wheeling idler rolls. 3,723,592, Cl. 264-290.00r.

Boillot, Jean R.: *See—*
Besson, Jean R.; and Boillot, Jean R., 3,722,258.

Boldan, John. Drain cleaners. 3,722,008, Cl. 4-255.000.

Bomberger, Arthur L., to National Bearings Company. Wheel-bearing assembly. 3,722,968, Cl. 308-191.000.

Bonfich, William; and Hoffman, James C., to Mobil Oil Corporation. Dual feed system for electrocoating bath. 3,723,275, Cl. 204-181.000.

Bonnell, Leonard J.: *See—*
Van Iderstine, Theodore J.; and Bonnell, Leonard J., 3,723,722.

Bonsky, Elmer C.: *See—*
Curtis, Lawrence A.; and Bonsky, Elmer C., 3,723,656.

Boogaart, Van Den; and Nicolaus, Louis Meelis, to N.V. Fabriek Van Chemische Producten Vondelingenplaat. Process for killing plant pests using cyanoalkylnotrophenyl carbonates. 3,723,625, Cl. 424-301.000.

Boom, Abraham A., to Celanese Corporation. Method and apparatus for plasma treatment of substrates. 3,723,289, Cl. 204-312.000.

Boorujy, Salem. Tertiary filtering arrangement. 3,722,681, Cl. 210-108.000.

Boose, Robert Carl; Weaver, Henry; and Moore, Harry, to Escoa Fintube Corporation. Fintube welding apparatus. 3,723,693, Cl. 219-62.000.

Borer, Herbert W.; and Shaff, Arthur R., to Caterpillar Tractor Company. Composite structural member. 3,722,864, Cl. 254-124.000.

Borg, Richard J.; Lai, David Y. F.; Riley, Neil R.; and Wolfe, James R., to California Metallurgical Industries, Inc. Cermet powders. 3,723,359, Cl. 252-513.000.

Borg-Warner Corporation: *See—*
Saternus, Joseph P., 3,722,010.

Borowski, Kurt: *See—*
Kubitzek, Alfred; and Borowski, Kurt, 3,723,934.

Borroni, Andrea: *See—*
Sarracino, Marcello; Ferrentino, Antonio; and Borroni, Andrea, 3,722,775.

Borucka, Alina Z.; Marianowski, Leonard G.; and Baker, Bernard S., to Institute of Gas Technology. Electrolyte seal means. 3,723,186, Cl. 136-153.000.

Bos, Julius Goeman; Draaijer, Harm; and Duyve, Jan, to U.S. Philips Corporation. Soldering flux composition. 3,723,191, Cl. 148-23.000.

Bosch, Robert, Elektronik G.m.b.H.: *See—*
Heinrich, Frank-Armin; Prause, Dieter; and Sost, Rolf, 3,723,641.

Bosch, Robert, G.m.b.H.: *See—*
von Lowis of Menar, Alexander, 3,722,960.

Bosch, Robert, Photokino G.m.b.H.: *See—*
Leisring, Herbert, 3,722,809.

Bose, Norman J.; and Brown, Alexander S., to Singer Company, The. Hand held magnetic reader. 3,723,669, Cl. 179-100.20c.

Boss, Otto: *See—*
Schlapp, Werner; and Boss, Otto, 3,722,390.

Bottoms, Harry Simister; and Lewis, Geoffrey Arthur, to Lucas, Joseph, (Industries) Limited. Electrically driven pump. 3,723,028, Cl. 417-356.

Boucher, Harold T.; Wheeler, Frank Arthur; and West, John Martin, to British Aircraft Corporation Limited. De-gassing of liquids. 3,722,180, Cl. 55-46.000.

Bouffard, Jean; and Dionne, Yvon Onil, to Northern Electric Company Limited. Method and apparatus for controlling the path of an elongate article. 3,722,770, Cl. 226-45.000.

Bourgeault, Leo B.: *See—*
Kautz, Robert F.; and Bourgeault, Leo B., 3,723,765.

Bourgeois, Joseph F., to Amana Refrigeration, Inc. Door closing and check device for refrigerators, freezers and the like. 3,722,031, Cl. 16-153.000.

Bourke, Patrick Terence. Marble faced wall panels a method of making same. 3,723,233, Cl. 161-68.000.

Bourns, Inc.: *See—*
Frey, Sydney W., Jr.; Gaa, Donald L.; and Tetamore, Robert W., 3,723,937.
Gramm, Eugene R., 3,723,938.

Bouton, Thomas Chester: *See—*
Kern, William John; Bouton, Thomas Chester; and Adams, Harold Elwood, 3,723,575.

Bouvier, Daniel, to S. T. Supont Societe Anonyme. Cigarette lighter using microencapsulated fuel. 3,723,051, Cl. 431-267.000.

Bowles, Lowell E. Wire wrap pin pointernone. 3,722,061, Cl. 29-203.00b.

Bowman, Robert A.: *See—*
Hautaniemi, Bruno Wendell; Bowman, Robert A.; and Bangerter, Kenneth R., 3,722,263.

Boyer, Emanuel F. Onion slicing machine. 3,722,339, Cl. 83-4.000.

Boyle, Robert F., to Pneumo Dynamics Corporation. High ratio linkage mechanism. 3,722,371, Cl. 92-5.00r.

Brackbill, Warren H.: *See—*
Campbell, Willis R.; and Brackbill, Warren H., 3,722,306.

Brackenbrough, Dennis D.; Godfrey, Harold E., Jr.; and Mills, Richard G. Adjustable shield device for shielding X-rays. 3,723,743, Cl. 250-108.00r.

Bradley, John J.; Schauffele, Carl N.; and St. Clair, John Q., II, to Eastman Kodak Company. Method and apparatus for deriving the velocity and relative position of continuously moving information bearing media. 3,723,650, Cl. 178-7.200.

Bradshaw, Christopher Patrick Cadman, to British Petroleum Company Limited, The. Disproportionation of olefins. 3,723,563, Cl. 260-683.00d.

Brainerd, Andrew W.; Brainerd, Kent H.; and Brainerd, Stuart W. Shoe cleaning-polishing device and methods of making the same. 3,722,021, Cl. 15-231.000.

Brainerd, Kent H.: *See—*
Brainerd, Andrew W.; Brainerd, Kent H.; and Brainerd, Stuart W., 3,722,021.

Brainerd, Stuart W.: *See—*
Brainerd, Andrew W.; Brainerd, Kent H.; and Brainerd, Stuart W., 3,722,021.

Brandle, Charles David, Jr.; and Miller, David Christopher, to Bell Telephone Laboratories, Incorporated. Technique for growth of single crystal gallium garnet. 3,723,599, Cl. 423-263.000.

Brandle, Karl: *See—*
Hahnkamm, Volker; Broja, German; Brandle, Karl; and Elstermann, Calus-Heinrich, 3,723,611.

Brandsdorfer, Arthur: *See—*
Scheinderman, Abraham; Rudzitis, Karl; Brandsdorfer, Arthur; and Wechsler, George, 3,722,774.

Brandt, Gerald B., to Westinghouse Electric Corporation. Coherent optical processing method and system having improved signal-to-noise ratio utilizing polarizing filters. 3,722,982, Cl. 350-147.000.

Brandt, James D.: *See—*
Tajchman, Edwin J.; and Brandt, James D., 3,723,907.

Branen, William T.; and Watson, Roger W., to Standard Oil Company. Polymeric succinimides and their derivatives as fuel and motor oil additives. 3,723,460, Cl. 260-326.50f.

Brassington, Samuel M., to Material Flow Inc. Twin track cartridge stereoscopic viewer. 3,722,983, Cl. 350-135.000.

Bratus, Anatoly Dmitrievich: *See—*

Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

Braun, Anton. Internal combustion engine fuel supply apparatus. 3,722,481, Cl. 123-46.00r.

Braun, Lorne D., to Canadian Patents and Development Limited. Parametric amplifier. 3,723,893, Cl. 330-4.900.

Braun, Marvin W. Advertising display device. 3,722,119, Cl. 40-132.00d.

Braunberger, Benjamin A., to Gehl Company. Windrowing means for agricultural machine. 3,722,191, Cl. 56-189.000.

Braver, Alvin Stanley, to International Air Conditioning. Modular heating and cooling apparatus. 3,722,580, Cl. 165-50.000.

Brayley, Elwin J.: *See—*
Swift, Thomas E.; and Brayley, Elwin J., 3,722,488.

Brayton, Donald B., to United States of America, Air Force. Laser velocimeter employing dual scatter detection. 3,723,004, Cl. 356-28.000.

Brean, John W., to Baldwin, D. H., Company. Day-night mirror for vehicles. 3,722,984, Cl. 350-280.000.

Breck, Donald W. Process for removal of ammonia from waste water streams. 3,723,308, Cl. 210-38.000.

Breillatt, Julian P., Jr., to United States of America, Atomic Energy Commission. Fibrous fibrin sheet and method for producing same. 3,723,244, Cl. 162-151.000.

Brennan, John F., to Universal Oil Products Company. Preparation of ketones. 3,723,535, Cl. 260-593.00r.

Brenneke, Arthur M., to TRW Inc. Circumferentially expansible oil ring. 3,722,897, Cl. 277-154.000.

Brenner, Charles H.; and Kassik, Ronald W., to Motorola, Inc. Intrusion detection false alarm reduction system. 3,723,738, Cl. 250-83.30h.

Brenner, Lawrence M. Air driven abrading device. 3,722,147, Cl. 51-170.00t.

Breunich, Theodore R.; and Hildenbrandt, August J., Jr., to Universal Oil Products Company. Flow control valve system with rapid closing valve. 3,722,534, Cl. 137-488.000.

Bridgeford, Douglas J., to Tee-Pak, Inc. Separation of ions or molecules from mixtures using graft-polymerized or polymer deposited ion exchange or permselective materials. 3,723,306, Cl. 210-22.000.

Bridgestone Tire Company Limited: *See—*
Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, 3,723,239.

Brinkmann, Ludwig; and Herwig, Walter, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Block copolyesters consisting essentially of linear saturated polyester and polystyrenebutadiene units. 3,723,574, Cl. 260-873.000.

British Aircraft Corporation Limited: *See—*
Boucher, Haroid T.; Wheeler, Frank Arthur; and West, John Martin, 3,722,180.
Everest, Frank G.; and Albery, Raymond L., 3,723,002.

British Petroleum Company Limited, The: *See—*
Bradshaw, Christopher Patrick Cadman, 3,723,563.

British Titan Limited: *See—*
Cole, Colin Francis; and Powell, Stanley, 3,723,149.

Britzman, Bruce E.: *See—*
Stewart, Andrew W.; Britzman, Gilbert J.; Bauer, Dale M.; and Britzman, Bruce E., 3,722,816.

Britzman, Gilbert J.: *See—*
Stewart, Andrew W.; Britzman, Gilbert J.; Bauer, Dale M.; and Britzman, Bruce E., 3,722,816.

Brock, John L.: *See—*
Stoffel, James C.; and Brock, John L., 3,722,471.

Brockett, Bruce W.; Miller, Robert E.; and Hinkle, Mary L., to National Cash Register Company, The. Record material. 3,723,156, Cl. 117-36.200.

Brockmann, Hans; and Scheer, Martin, to Farbenfabriken Bayer Aktiengesellschaft. Beta-rhodomycin V. 3,723,411, Cl. 260-210.0ab.

Brod, Ilya Iosifovich: *See—*
Krolikov, Boris Zakharovich; Krylov, Jury Petrovich; and Brod, Ilya Iosifovich, 3,722,466.

Brodie, Ivor: *See—*
Dahlquist, John A.; and Brodie, Ivor, 3,722,453.

Brodnitz, Michael H.; and Pascale, John V., to International Flavors & Fragrances Inc. Novel flavor compounds and process for producing and utilizing the same. 3,723,135, Cl. 99-140.00r.

Broja, German: *See—*
Hahnkamm, Volker; Broja, German; Brandle, Karl; and Elstermann, Calus-Heinrich, 3,723,611.

Brolund, Theodore F.; and Kuchar, William E., to Whitney, W. A., Corporation. Fluid-actuated punch press with workpiece stripper. 3,722,337, Cl. 83-137.000.

Brondum, Hazel: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

Brother Kogyo Kabushiki Kaisha: *See—*
Watanabe, Tomoyoshi; and Jozuka, Masao, 3,722,654.

Brown & Williamson Tobacco Corporation: *See—*
Reynolds, Martin Lance; Hammersmith, James R.; and Parish, Harlie A., Jr., 3,722,515.

Brown, Alexander S.: *See—*
Bose, Norman J.; and Brown, Alexander S., 3,723,669.

Brown, Arthur E. Rotary displacement machines. 3,723,031, Cl. 418-15.000.

Brown, Boveri & Company, Limited: *See—*
Marek, Alois, 3,723,775.

Brown, Cicero C. Well drilling apparatus. 3,722,603, Cl. 173-159.000.

Brown, D. S., Company, The: *See—*
Brown, Howard R., 3,722,161.

Brown, David A.: *See—*
Plumley, Elizabeth Emmett, 3,722,402.

Brown, Dwight L. Device for protecting against A.C. transient overloads with means for automatically resetting same. 3,723,820, Cl. 317-16.000.

Brown, Edward A., to Eastman Kodak Company. Chuck for rotatable members. 3,722,808, Cl. 242-46.400.

Brown, Harold, Company: *See—*
Love, Addison N., 3,722,851.

Brown, Hart. Contact apparatus. 3,723,071, Cl. 23-283.000.

Brown, Hart. Contact process and apparatus. 3,723,180, Cl. 134-25.000.

Brown, Howard R., to Brown, D. S., Company, The. Curtain wall window gasket construction. 3,722,161, Cl. 52-400.000.

Brown, Ian G.: *See—*
Ehlers, Kenneth W.; Brown, Ian G.; and Lietzke, Alan F., 3,723,703.

Brown, Lester F., to Standard Concrete Pipe Company, Inc. Tool for forming asbestos linings and the like. 3,723,041, Cl. 425-262.000.

Brown, Lloyd H.; Eftax, Daniel S. P.; Everett, George S.; and Oldham, James R., to Quaker Oats Company, The. Fast baking core composition and process for preparation thereof. 3,723,368, Cl. 260-17.200.

Brown, Maurice H.: *See—*
Lunt, Wilbur B.; and Brown, Maurice H., 3,722,416.

Brown, Richard L., to Bally Manufacturing Corporation. Frontally raiseable vehicles amusement apparatus. 3,722,884, Cl. 273-1.00e.

Brown, Robert J. S., to Chevron Research Company. Crossed-coil nuclear magnetism well logging apparatus and method utilizing a polarizing field and an additional polarizing field to shift the direction of polarization. 3,723,856, Cl. 324-.50g.

Brownstein, Arthur M.: *See—*
Hollstein, Elmer J.; and Brownstein, Arthur M., 3,723,436.

Brunken, Walter R., to Scientific Tube, Inc., mesne. Tube forming method and apparatus. 3,722,248, Cl. 72-176.000.

Bruns, Enno: *See—*
Gritsch, Herbert; Meyerhoff, Herwig; Bruns, Enno; and Hemmie, Gerd, 3,723,959.

Bryant, Charles E. Mobile home skirting. 3,722,156, Cl. 52-169.000.

Bucaram, Salim M.; and Mortimer, Alfred L., to Atlantic Richfield Company. Paraffin deposition inhibition in oil. 3,722,592, Cl. 166-304.000.

Buchel, Karl Heinz; Grewe, Ferdinand; and Kospers, Helmut, to Farbenfabriken Bayer Aktiengesellschaft. Fungicidal composition and methods of pilling fungi using 1-trityl-1,2 4-treazoles. 3,723,622, Cl. 424-269.000.

Buchheit, Joseph J., to Reply-O-Letter Company, Inc. Mailing form with integral reply envelope attached. 3,722,787, Cl. 229-92.300.

Buchler Instruments Division, Nuclear-Chicago Corporation: *See—*
Gelfand, Daniel, 3,723,030.

Buckland, Bruce O., to General Electric Company. Bearing seal and oil tank ventilation system. 3,722,624, Cl. 184-6.110.

Bucknell, Ernest H.: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

Bucknell, Lenora: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

Budd Company, The: *See—*
Gutnajer, Ludwik, 3,723,695.

Buddrus, Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for preparing alkylidene phosphoranes. 3,723,537, Cl. 260-606.50p.

Budrys, Ignas; and Lee, Ernest O., Jr., to Stromberg-Carlson Corporation. Group hunting circuit. 3,723,659, Cl. 179-18.0ha.

Buescher, Wilhelm, to Vendo Company, The. Dual price selective bottled beverage vending apparatus. 3,722,650, Cl. 194-10.000.

Buescher, William E., to GTE Sylvania Incorporated. Methods of improving adherence of emissive material in thermionic cathodes. 3,722,045, Cl. 29-25.170.

Bullmerwerk Karl Bullmer: *See—*
Lange, Erwin, 3,722,328.

Bullock, Clifford R.: *See—*
Robbins, William Paul; and Bullock, Clifford R., 3,722,039.

Bunce, Michael Kelly; Bush, Stanley Edward; Fargo, George Arthur, Jr.; and Saltus, George Edwin, to Bell Telephone Laboratories, Incorporated. Group switching arrangement for key telephone systems. 3,723,654, Cl. 179-2.0tv.

Burgi, Xaver. Attachable label. 3,722,118, Cl. 40-21.00r.

Burke, Edward A.: *See—*
Wall, James A.; and Burke, Edward A., 3,723,740.

Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Intravenous injection apparatus drip chamber having filter means. 3,722,697, Cl. 210-451.000.

Burron Medical Products, Inc.: *See—*
Burke, George K.; and Raines, Kenneth, 3,722,697.

Burroughs Corporation: *See—*
Moister, Douglas E., Jr., 3,723,858.

Burton, Jay E., to Drake, Crandell & Batchelder, mesne. Downed-aircraft radio-locator beacon and related apparatus. 3,723,881, Cl. 325-115.000.
Burz, Oskar: *See—*
Jentges, Heribert; and Burz, Oskar, 3,722,872.
Busch, Paul F.; and Krumme, John F., to Ski Valet, Inc. Storage and locking assembly for skis and poles. 3,722,652, Cl. 194-64.000.
Buschmann, Horst, to Schloemann Aktiengesellschaft. Conveying and cooling lengths of semi-finished products. 3,722,709, Cl. 214-1.0bc.
Buschow, Kurt Heinz Jurgen; Westendorp, Frans Frederik; and Wijn, Henricus Petrus Johannes. Method of manufacturing a body having anisotropic, permanent magnetic properties. 3,723,197, Cl. 148-103.000.
Bush, Stanley Edward: *See—*
Bunce, Michael Kelly; Bush, Stanley Edward; Fargo, George Arthur, Jr.; and Saltus, George Edwin, 3,723,654.
Bush, Walter R.: *See—*
Ambler, E. Curtis; Scoville, Andrew E.; and Bush, Walter R., 3,723,815.
Bushmeyer, Richard W.; and Miller, Charles D.; deceased (by Holmstrom, John, Jr.; administrator), to Case, J. I., Company. Bite-size body of hay. 3,723,129, Cl. 99-2.000.
Butler, Anthony J., to Dow Corning Corporation. Propellants and refrigerants based on trifluoropropene. 3,723,318, Cl. 252-67.000.
Butler, John Mann; Follett, Archie E.; and Cass, Robert A., to United States of America, Atomic Energy Commission, mesne. Explosive composition containing lithium perchlorate and a nitrated amine. 3,723,202, Cl. 149-19.000.
Butler, William D. Method of clacining limestone. 3,722,867, Cl. 423-175.000.
Butterfield, Max E.; Hoerr, Richard H.; McLees, Alan L.; and Proksch, Frederick D., to Caterpillar Tractor Company. Sandwich deck construction. 3,722,618, Cl. 181-33.00g.
Butzbacher Weichenbau Gesellschaft mbH: *See—*
von Hayn, Ernst, 3,723,728.
Byers, Robert D.; and Hartford, Winslow H., to Allied Chemical Corporation. Black chromium plating process and composition. 3,723,261, Cl. 204-51.000.
Caddock, Richard E. Method of making power resistors. 3,722,084, Cl. 29-610.000.
Caddock, Richard E. Method of making film-type power resistors. 3,722,085, Cl. 29-620.000.
Cahill, Lysle D.: *See—*
Behane, David; Spradley, Lewis Harold; Cahill, Lysle D.; and Marshall, William W., 3,723,646.
Cahn, Arno; Ackilli, Joseph Anthony; and Carroll, Frank Emery, to Lever Brothers Company. Combinations of hydroxyalkyl-N-methyltaurines and anionic surfactants as synergistic emulsifiers. 3,723,356, Cl. 252-526.000.
Cairns, Robert Lacock; and Benjamin, John Stanwood, to International Nickel Company, Inc., The. Extrusion of canned metal powders using graphite follower block. 3,723,109, Cl. 75-214.000.
California Metallurgical Industries, Inc.: *See—*
Borg, Richard J.; Lai, David Y. F.; Riley, Neil R.; and Wolfe, James R., 3,723,359.
Calkins, Edward E.: *See—*
Poling, Dan W.; Calkins, Edward E.; and Fagaly, Robert L., 3,723,046.
Callander, George C.: *See—*
Sheahan, Desmond F.; and Callander, George C., 3,723,920.
Cam Industries, Inc.: *See—*
Rickrode, Cyril J.; and Becker, Charles A., 3,722,144.
Cameron Iron Works, Inc., mesne: *See—*
Carman, Richard Jan, 3,723,956.
Cameron-Johnson, Alan, to Hawker Siddeley Aviation Limited. Sealing gland with unstressed standby seal. 3,722,894, Cl. 277-9.000.
Camp, Albert T., to United States of America, Navy. Process for preparing stable essentially water-free slurries of nitrocellulose and products thereof. 3,723,207, Cl. 149-92.000.
Camp, Bryon; Camp, Percival Arthur; and Meyer, William Hasso. Group wash station. 3,722,007, Cl. 4-166.000.
Camp, Percival Arthur: *See—*
Camp, Bryon; Camp, Percival Arthur; and Meyer, William Hasso, 3,722,007.
Campbell, Francis Robert: *See—*
Weatherup, William Paul; and Campbell, Francis Robert, 3,723,946.
Campbell, Fred D.: *See—*
United States of America, National Aeronautics and Space Administration in respect to the invention of, 3,723,745.
Campbell, Frederic: *See—*
Mac Donald, Eric; and Campbell, Frederic, 3,723,128.
Campbell, Robert H.; and Cherry, Wesley R., to Sun Oil Company of Pennsylvania, mesne. Hot melt adhesive having improved creep properties. 3,723,371, Cl. 260-28.5av.
Campbell, Willis R.; and Brackbill, Warren H., to Sperry Rand Corporation. Apron drive for a manure spreader. 3,722,306, Cl. 74-219.000.
Campbell, Willis R., to Sperry Rand Corporation. Apron drive for a manure spreader. 3,722,307, Cl. 74-219.000.
Canadian Industries Limited: *See—*
Falconer, Errol Linton, 3,723,208.
Canadian Patents and Development Limited: *See—*
Braun, Lorne D., 3,723,893.
Walden, Cecil C.; and Howard, Terence E., 3,723,255.
Canarutto, Claudio, to Olivetti, Ing., C., & C., S.p.A. Apparatus having a plurality of multi-position switches for automatically testing electronic circuit boards. 3,723,867, Cl. 324-73.0pc.
Canepa, William P., to Kay-Cee Industrial Products, Inc. Slide fastener coating apparatus and method. 3,723,225, Cl. 156-554.000.
Cannon, James D., to Motorola, Inc. Mixing circuit utilizing linear resistances. 3,723,910, Cl. 332-31.00t.
Canon Kabushiki Kaisha: *See—*
Kinjo, Kikuo; Yamanouchi, Teruo; Kondo, Eiichi; and Wada, Yasuo, 3,723,116.
Kitajima, Nobuo; Masaki, Tatsuo; and Kondo, Hideyo, 3,723,105.
Mashimo, Yujio, 3,723,810.
Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, 3,722,994.
Cantarutti, Armindo: *See—*
Matsuoka, James T.; and Cantarutti, Armindo, 3,723,039.
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, to Vochenhuber, Karl and Hauser, Raimund. Automatic synchronization of two strip drives. 3,722,987, Cl. 352-17.000.
Capitol Reproductions, Inc.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alire R., 3,723,001.
Cappucci, Joseph D., to Merrimac Industries, Inc. Lumped constant quadrature coupler with improved parasitic suppression. 3,723,914, Cl. 333-11.000.
Carbon, Theo; and Kessler, Reinhard, to Fichtel & Sachs AG. Hub shell assembly for a bicycle and method of making the same. 3,722,959, Cl. 301-105.00b.
Carborundum Company, The: *See—*
Cichy, Paul; and Anderson, Robert O., 3,723,631.
Economy, James; and Clark, Rodger A., 3,723,588.
Ixer, Bernard W.; and Baughman, Davis Lee, 3,722,710.
Carlson, Paul A.: *See—*
Atkins, Carl E.; and Carlson, Paul A., 3,723,967.
Carlson, Reuben C., to Zenith Radio Corporation. Multi-band television tuner arrangement. 3,723,882, Cl. 325-357.000.
Carlstein, Joseph, to Vernitron Corporation. Telemetering system for displaying analog and digital data. 3,723,986, Cl. 340-177.00r.
Carlton Machine Tool Company, The: *See—*
Lehmkuhl, Robert A., 3,723,016.
Carman, Richard Jan, to Cameron Iron Works, Inc., mesne. Acoustic control transmitter. 3,723,956, Cl. 340-5.00r.
Carmichael, Keith Stewart; and Lester, Joseph Thomas, Jr., to Du Pont de Nemours, E. I., and Company. Noneverting bottom for thermoplastic bottles. 3,722,726, Cl. 215-1.00c.
Carney, William V., to Porta Systems Corporation. Switching apparatus. 3,723,679, Cl. 200-50.00b.
Carpenter, Eugene C., to Outboard Marine Corporation. Hydraulic power trim and power tilt system for a marine propulsion device. 3,722,455, Cl. 115-41.0ht.
Carpenter, John L., to Container Corporation of America. Cushioned shipping folder. 3,722,668, Cl. 206-46.0fr.
Carpenter, Robert E.; and Peterson, Curtis R., to Ashland Oil, Inc. High pressure continuous process for polyesters from dicarboxylic acid anhydrides and monoepoxides. 3,723,390, Cl. 260-75.00m.
Carroll, Frank Emery: *See—*
Cahn, Arno; Ackilli, Joseph Anthony; and Carroll, Frank Emery, 3,723,356.
Carson, Don B.; and Hennemuth, William R., to Universal Oil Products Company. Fluid contacting apparatus. 3,723,072, Cl. 23-288.00r.
Carson, Don B.; and Hennemuth, William R., to Universal Oil Products Company. Fluid contacting method for fluid-solid contacting. 3,723,300, Cl. 208-146.000.
Carter, Carl W.; and Johnson, Lloyd E., to Caterpillar Tractor Company. Gear train for gas turbine engines. 3,722,213, Cl. 60-39.16r.
Carter, Herbert S.: *See—*
Woodley, Clifford E.; and Carter, Herbert S., 3,722,430.
Carter, John R.: *See—*
Chen, Wei L.; and Carter, John R., 3,723,719.
Cartwright, Cyril A.: *See—*
Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., 3,723,276.
Cary, Thomas Francis. Camper and cabinet construction therefor. 3,722,946, Cl. 296-23.0mc.
Case, J. I., Company: *See—*
Blakely, Richard P., 3,722,724.
Bushmeyer, Richard W.; and Miller, Charles D., 3,723,129.
Engelmann, Roger F., 3,722,524.
Casper, Lee A., to Iron Mountain, Inc. Heat sealing apparatus and method. 3,723,212, Cl. 156-69.000.
Cass, Robert A.: *See—*
Butler, John Mann; Follett, Archie E.; and Cass, Robert A., 3,723,202.
Castrucci, Paul P.; Grochowski, Edward G.; Hess, Martin S.; and Zachos, Elias B., to International Business Machines Corporation. Epitaxial middle diffusion isolation technique for maximizing microcircuit component density. 3,723,200, Cl. 148-175.000.
Caterpillar Tractor Company: *See—*
Barnes, Dwaine R., 3,722,057.
Bartholomew, Paul E., 3,723,021.
Borer, Herbert W.; and Shaff, Arthur R., 3,722,864.
Butterfield, Max E.; Hoerr, Richard H.; McLees, Alan L.; and Proksch, Frederick D., 3,722,618.
Carter, Carl W.; and Johnson, Lloyd E., 3,722,213.

Knell, Harvey A.; Olthoff, James A.; Scoggin, Barry A.; and Smith, Roger M., 3,722,114.
Muntjanoff, John R., 3,722,916.
Olson, George E., 3,723,022.

Catroppa, Frank A.: *See—*
De Simone, David N.; and Catroppa, Frank A., 3,721,994.

C.A.V. Limited: *See—*
Leonard, Gordon Harris; Sobecki, Zygmunt; and Lomas, Peter Robert, 3,723,817.

Cavalier Corporation: *See—*
Payne, Harry R., 3,722,744.

Cavanaugh, R. J.: *See—*
Fertl, Walter H.; and Cavanaugh, R. J., 3,722,606.

Cavil, David T., to Outboard Marine Corporation. Bi-directional voltage control for permanent magnet alternator. 3,723,844, Cl. 320-59.000.

CCI Aerospace Corporation: *See—*
Hammill, William R., 3,722,797.

Celanese Corporation: *See—*
Bohrer, Thomas Carl; Ecker, George Franklin; and Chen, David Hsiao Tsung, 3,723,592.
Boom, Abraham A., 3,723,289.
Druin, Melvin, 3,723,157.
Druin, Melvin L.; Ferment, George R.; and Rao, Velliyur N. P., 3,723,150.
Kalnin, Ilmar L., 3,723,607.
Rakus, Julius P.; Penoyer, John A.; and Kowalski, Michael, 3,723,241.
Ram, Michael J., 3,723,605.

Cenco Medical/Health Supply Corporation: *See—*
Goya, Tamotsu; and Sill, James E., 3,721,999.

Centre Electronique Horloger S.A.: *See—*
Challandes, Claude, 3,722,207.

Century Tool Company, Inc.: *See—*
Mann, Basil B., 3,722,762.

Cerrocchi, Lino: *See—*
Daga, Giorgio Abbate; Cerrocchi, Lino; and Fracassi, Pietro, 3,723,285.

Cetrulo, Frank A., Jr., to National Factors, Inc. Driving lug structure for endless track. 3,722,963, Cl. 305-38.000.

Chaddha, Ashwani K. Data communication system. 3,723,972, Cl. 340-172.500.

Challandes, Claude, to Centre Electronique Horloger S.A. Universal timepiece. 3,722,207, Cl. 58-42.500.

Chandler, Ronald W.; and Hammond, Jack B., to Tetradyne Corporation. Volumetric flow rate measurement of a flowing stream. 3,722,276, Cl. 73-194.00e.

Chandre, Arthur J.; and Moericke, Dieter, to Rex Chainbelt Inc. Rail anchor applicator. 3,722,422, Cl. 104-17.00a.

Chang, Henry M., to First Dynamics, Inc. Combination food container and implement for extracting the contents. 3,722,779, Cl. 229-1.50c.

Chang, Milton M. T.: *See—*
McCrickered, John T.; and Chang, Milton M. T., 3,723,010.

Chapman Industries Inc.: *See—*
MacDonald, John A., 3,723,234.

Chapp, John P., to Monsanto Company. Herbicidal compositions and methods. 3,723,087, Cl. 71-92.000.

Chapuis, Marcel, to Stanadyne, Inc. Fuel injector. 3,722,801, Cl. 239-533.000.

Charewicz, Francis J., to General Electric Company. Low voltage secondary lightning arrester sparkgap assembly. 3,723,819, Cl. 317-61.000.

Charles, Daniel R., to Thomson-CSF. Flat cathode-ray tube for direct viewing spot display. 3,723,786, Cl. 313-70.00r.

Charles Supper Company: *See—*
Thomas, Roy L., Jr., 3,723,006.

Charnley, John, to Thackray, Chas., F., Limited. Acetabular sockets. 3,722,002, Cl. 3-1.000.

Chase, Myron C., to Weatherby/Nasco, Inc. Injection training aid. 3,722,108, Cl. 35-17.000.

Chatterjee, Pronoy K.; and Kwok, Michael C., to Personal Products Company. Water-insoluble fluid-absorptive and retentive materials and methods of making the same. 3,723,413, Cl. 260-232.000.

Chaupit, Jean, to Compagnie Generale d'Electricite. Semiconductor system redundant control arrangement. 3,723,847, Cl. 321-27.00r.

Chemerda, John M.: *See—*
Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., 3,723,496.

Chemical Construction Corporation: *See—*
Tourtellotte, John F., 3,722,189.

Chemische Werke Albert: *See—*
Reese, Johannes; and Hotze, Hermann, 3,723,572.
Skurnia, Uwe; and Rohlfs, Hans, 3,723,603.

Chen, David Hsiao Tsung: *See—*
Bohrer, Thomas Carl; Ecker, George Franklin; and Chen, David Hsiao Tsung, 3,723,592.

Chen, Tien Chi; and Ho, Irving T., to International Business Machines Corporation. Fast modulo threshold operator binary adder for multi-number additions. 3,723,715, Cl. 235-175.000.

Chen, Wei L.; and Carter, John R., to Singer Company, The. Ground range computer. 3,723,719, Cl. 235-190.000.

Cheng, Wai Ming; Davies, James Francis; and Stuttard, Leonard Wallace, to Lever Brothers Company. Detergent compositions. 3,723,326, Cl. 252-107.000.

Cherednichenko, Genrikh Moiseevich: *See—*
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.

Cherel, Guy Henry, to Saint-Gobain Techniques Nouvelles. Apparatus and process for the treatment of spent fuel. 3,722,338, Cl. 83-278.000.

Chernenko, Galina Motseevna: *See—*
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra,3,723,400.

Cherry, Wesley R.: *See—*
Campbell, Robert H.; and Cherry, Wesley R., 3,723,371.

Chevron Research Company: *See—*
Brown, Robert J. S., 3,723,856.
De Vries, Louis, 3,723,501.

Chiang, James A., to Ford Motor Company. Indicator mechanism. 3,722,458, Cl. 116-129.000.

Chicago Bridge & Iron Company: *See—*
Stubert, John Wesley, 3,722,936.

Chidzhavadze, Grigory Yasonovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Chiesa, Luigi, to Morenar S.A. Automatic coin or token operated apparatus for taking and developing photographs. 3,722,384, Cl. 95-14.000.

Chinuki, Takashi: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D. Electric incandescent lamps having refractory metal phosphate and phosphide coatings for refractory metal leads. 3,723,792, Cl. 313-318.000.

Chitester, John Alvin; and Jonas, Frank D., to Oxford Pendaflex Corporation. Extensible drawer support. 3,722,964, Cl. 308-3.800.

Chivers, Thomas E., to General Mills, Inc. Process for making candy floss. 3,723,134, Cl. 99-134.000.

Chopin, Jean; and Eloy, Jacques, to Automobiles Peugeot. Post-combustion reactor for exhaust gases of an internal combustion engine. 3,722,221, Cl. 60-282.000.

Chow, Sui-Wu; and Matzner, Markus, to Union Carbide Corporation. Alkali metal mercaptides as urethane-isocyanurate catalysts. 3,723,367, Cl. 260-2.5ab.

Chupp, John P., to Monsanto Company. Preparation of 1,4-substituted-imidazolin-2-ones. 3,723,455, Cl. 260-309.600.

Church, David R.: *See—*
Steinhauer, Roger C.; Falevitch, Leonard A.; and Church, David R., 3,723,376.

Church, Herman S.; and Hagener, James L., to Teledyne Mid-America Corporation. Vehicle bumper mount construction. 3,722,939, Cl. 293-88.000.

Churn, Michael C., to Mobil Oil Corporation. Lubricant useful in metal working. 3,723,313, Cl. 252-33.300.

Ciba-Geigy A.G.: *See—*
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, 3,723,490.
Langauer, Theodor, 3,723,614.
Oswald, Richard Alan; and Stark, Bernard Peter, 3,723,559.
Thaddey, Kurt, 3,723,969.

Ciba-Geigy Corporation: *See—*
Ackermann, Hans; and Creutzburg, Gerhard, 3,723,425.
Berrer, Dagmar; and Vogel, Christian, 3,723,088.
Darko, Laszlo L., 3,723,624.
Dexter, Martin; Spivack, John D.; and Steinberg, David H., 3,723,489.
Dexter, Martin; Spivack, John D.; and Steinberg, David Herbert, 3,723,503.
Furia, Thomas E.; and Steinberg, David H., 3,723,435.
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,723,547.
Jeger, Iskar; Wehrli, Hans Ueli; and Schaffner, Kurt, 3,723,418.
Suryanarayana, Yelogondahally Subrananiam; and Durrell, William Sandford, 3,723,065.
Weiss, Claus Dieter; and Rumpf, Jurg, 3,723,415.
Zergenyi, Janos; and Habicht, Ernst, 3,723,619.

Cichy, Paul; and Anderson, Robert O., to Carborundum Company, The. Skull melting furnace with removable bottom and process for furnace operation. 3,723,631, Cl. 13-9.000.

Cincinnati Milacron, Inc.: *See—*
Seidel, William B., 3,722,711.

Ciolfi, Quentin P., III. Flag holder. 3,722,841, Cl. 248-43.000.

Citizen Watch Co., Ltd.: *See—*
Barozzi, Gian Piero; and Horeschi, Giancarlo, 3,722,795.

Clapp, James Wellington: *See—*
Lies, Thomas Andrew; and Clapp, James Wellington, 3,723,494.

Clark, Burton P.: *See—*
Tassie, Douglas P.; and Clark, Burton P., 3,722,356.

Clark, John B. Direct reading aberration-free compensator with adjustable sensitivity for use in white light interferometry. 3,723,009, Cl. 356i107.000.

Clark, John Patrick: *See—*
Malcik, Frank John; Whittemore, Edward William; and Clark, John Patrick, 3,722,701.

Clark, Raymond; and Knutson, Dale A., to Applied Power Industries, Inc. Steering system. 3,722,367, Cl. 91-367.000.

Clark, Rodger A.: *See—*
Economy, James; and Clark, Rodger A., 3,723,588.

Clary, John G.; and Wirtz, Larry K., to Addmaster Corporation. Keyboard switch assembly with wire conductor matrix contact array. 3,723,673, Cl. 200-1.00r.

Clay, Howard W., to Sterling Radiator Company, Inc. Automatic assembling and welding machine. 3,723,702, Cl. 219-124.000.

Clay, John P.; and Lintvedt, Vernon L., to General Dynamics Corporation. Insulation material. 3,723,231, Cl. 161-53.000.

Clayson N.V.: *See—*
Strubbe, Gilbert J., 3,722,193.

Clayton Corporation: *See—*
Hug, Richard C., 3,722,760.

Clemett, Edwin F., Jr.: *See—*
Tucker, Thomas M.; and Clemett, Edwin F., Jr., 3,723,683.

Clipp, Louis L.: *See—*
Hall, James M.; and Clipp, Louis L., 3,722,819.

Coakley, James L., to Abex Corporation. Variable bypass for fluid power transfer systems. 3,723,025, Cl. 417-299.000.

Coburn, Ronald L.; and Roth, Oyvind, to International Business Machines Corporation. Digital tachometer with symmetrical output. 3,723,748, Cl. 250-233.000.

Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis Des., to Acushnet Company. Correlated set of clubs with indicator line. 3,722,887, Cl. 273-77.00a.

Cochran Western Corporation: *See—*
Duerksen, Arnold, 3,722,921.

Codex Corporation: *See—*
Forney, George D., Jr., 3,723,911.

Coeppert, Erwin. Speed control device. 3,722,322, Cl. 74-675.000.

Cognacq, Jean-Claude: *See—*
Dvolaitzky, Frajda; and Cognacq, Jean-Claude, 3,723,420.

Colchagoff, Robert D., to Owens-Illinois, Inc. Method and apparatus for blending molten glass. 3,723,084, Cl. 65-136.000.

Colchester, John Edward; and Blundell, Thomas, to Imperial Chemical Industries Limited. Manufacture of bipyridylium salts. 3,723,444, Cl. 260-295.0am.

Cole, Colin Francis; and Powell, Stanley, to British Titan Limited. Treatment of titanium dioxides. 3,723,149, Cl. 106-300.000.

Cole, Gordon E., Jr.: *See—*
Althouse, Harlan E.; Scott, Fremont L.; and Cole, Gordon E., Jr., 3,723,379.

Cole, Joseph E., to Scovill Manufacturing Company. Popcorn popper having automatic buttering means. 3,722,399, Cl. 99-323.800.

Cole National Corporation: *See—*
Hungerford, Philip C., Jr.; and Richens, Robert H., 3,722,341.

Colgate-Palmolive Company: *See—*
Hansen, Kenneth R., 3,723,357.
Hewitt, Gordon Trent, 3,723,360.
Kenkare, Divaker B.; and Shumway, Durland K., 3,722,752.
Miles, Gilbert de Wayne, 3,722,753.

Collie, Stafford D., to Phillips Petroleum Company. Folding carton. 3,722,782, Cl. 229-39.00r.

Collins and Aikman Corporation: *See—*
Bauer, Jackson, 3,723,217.

Collins, Howard William, to International Rectifier Corporation. Solid state relay circuit with optical isolation and zero-cross firing. 3,723,769, Cl. 307-252.0ua.

Collins Radio Company: *See—*
Hutsinger, Dean P., 3,723,890.
Runyan, Wesley G.; and Staley, Lewis E., 3,723,871.
Sather, Dalaine C., 3,723,842.
Sather, Delaine C., 3,723,886.

Collom, Cletus J., to Weltronic Company. Tens and units timer for a welding system. 3,723,772, Cl. 307-293.000.

Colman, Albert J.; Zandberg, Paul I.; and Taylor, Harles F. Method and means for making dental impressions. 3,722,097, Cl. 32-17.000.

Columbus McKinnon Corporation: *See—*
Hawkins, Harold V.; and Forys, Joseph E., 3,722,316.

Combustion Engineering, Inc.: *See—*
Young, James E., 3,722,848.

Comer, William T.: *See—*
Matier, William L.; and Comer, William T., 3,723,627.

Comissariat a l'Energie Atomique: *See—*
Lazzari, Jean-Pierre; Melnick, Igar; and Vallet, Jean-Yves, 3,723,665.

Comm, Daniel, to Dano Modules, Inc. Method of modular building construction. 3,722,168, Cl. 52-742.000.

Commercial Shearing & Stamping Company: *See—*
Mazur, Joseph N.; Ratkay, Edward J.; and Hodgson, Robert F., 3,722,540.

Commissariat a l'Energie Atomique: *See—*
Michaud, Jean-Francois; and Delapierre, Gilles, 3,723,866.

Communications Satellite Corporation: *See—*
Kaul, Pradman P.; and Golding, Leonard S., 3,723,879.

Compackager Corporation: *See—*
O'Leary, Timothy W.; and Hopkins, Stephen, 3,722,561.

Compagnie Generale d'Electricite: *See—*
Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,723,634.
Chaupit, Jean, 3,723,847.
Ricard, Louis, 3,723,864.

Compagnie Internationale pour l'Informatique: *See—*
Lazzari, Jean-Pierre; Melnick, Igar; and Vallet, Jean-Yves, 3,723,665.

Computer Image Corporation: *See—*
Harrison, Lee, III; Wells, Frank David; and Honey, Francis J., 3,723,803.
Tajchman, Edwin J.; and Brandt, James D., 3,723,907.

Condon, Joseph Henry, to Bell Telephone Laboratories, Incorporated. Differential pulse code modulation system employing periodic modulator step modification. 3,723,909, Cl. 332-11.00d.

Conklin, Thomas H.: *See—*
Liebert, Richard B.; and Conklin, Thomas H., 3,723,278.

Conner, Elmer W. Anti-jacknifing device for tractor-trailer trucks. 3,722,918, Cl. 280-432.000.

Conner, Rex C.; and Ferstandig, Louis L., to Halocarbon Products Corporation. Prime mover system utilizing trifluoroethanol as working fluid. 3,722,211, Cl. 60-36.000.

Connolly, Edward A., to Fraser Sweatman, Inc. Protective cap. 3,722,533, Cl. 137-382.000.

Conoflow Corporation: *See—*
Metz, Thomas R.; and Holben, Eugene F., 3,722,265.

Consolidated Packaging Corporation: *See—*
Page, William H.; and Spillson, George A., 3,722,781.

Conta, Renato; and Mariani, Giuseppe, to Olivetti, Ing. C., & C., S.p.A. Machine for checking and correcting elements of hybrid integrated circuits by memorizing data. 3,723,694, Cl. 219-69.00v.

Container Corporation of America: *See—*
Carpenter, John L., 3,722,668.

Conti, Francesco Ettore. Installation for recovering electric power, combined with an alumina manufacturing installation. 3,723,073, Cl. 23-293.000.

Continental Can Company of Canada Limited: *See—*
Hughes, Robert G.; and Ruetz, Lloyd B., 3,722,737.

Continental Drilling Company: *See—*
Hiestand, James C.; and Thies, Richard O., 3,722,497.

Continental Oil Company: *See—*
Fertl, Walter H.; and Cavanaugh, R. J., 3,722,606.
Gratz, Ronald L., 3,722,223.
Maxson, Orwin, G., 3,722,591.
Thakker, Mahendra T., 3,723,291.

Control Data Corporation, mesne: *See—*
Lyons, James Francis; and De Filippis, Tullio, 3,723,955.

Controle Bailey (Societe Anonyme): *See—*
Baudelet de Livois, Guy M., 3,723,047.

Controls Company of America: *See—*
Obermann, George, 3,722,304.

Conwed Corporation: *See—*
Gaffney, Bernard J., 3,723,218.

Cooke, Albert Edward, to Triplite Limited. Method and means for circular knitting. 3,722,231, Cl. 66-132.000.

Cooke, David A., to United States of America, Navy. Torpedo homing system. 3,722,446, Cl. 114-23.000.

Coombs, Robert V., to Sandoz-Wander, Inc. 11β-methyl-17α-propadienyl steroids. 3,723,483, Cl. 260-397.450.

Cooper, Bryan E.: *See—*
Owen, William J.; and Cooper, Bryan E., 3,723,402.

Cooper, Jerry W.: *See—*
Haley, John S.; and Cooper, Jerry W., 3,722,961.

Cooper, Jerry W., to Dayco Corporation. Drive sprocket. 3,722,962, Cl. 305-35.0eb.

Cooper, John A.: *See—*
Wogman, Ned A.; Perkins, Richard W.; Rieck, Henry G.; and Cooper, John A., 3,723,727.

Copping, Christopher; and Uri, Norbert, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in her Britannic Majesty's Government of The, mesne. Reduction of oxidative degradation and the catalysis of peroxide decompositon. 3,723,384, Cl. 260-45.75n.

Corbett, Thomas J. Grass-catching and bagging apparatus for rotary lawn-mowers. 3,722,192, Cl. 56-202.000.

Cordes, Charles P. Metal drum stick. 3,722,350, Cl. 84-422.000.

Cordner, Michael A.; and Grimm, Duane H., to Sundstrand Corporation. Hydromechanical transmission. 3,722,324, Cl. 74-687.000.

Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., to Monsanto Company. Poly(vinyl acetate-dialkyl maleate acrylic acid) textile sizes. 3,723,381, Cl. 260-33.8ua.

Cornacchio, Nancy A.: *See—*
Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., 3,723,137.

Cornell, Cyrus J. Multiple saw lumber trimmer. 3,722,343, Cl. 83-422.000.

Corning Glass Works: *See—*
Anderson, Robert P., 3,723,590.
Beall, George H.; and Rittler, Hermann L., 3,723,140.
Dumbaugh, William H., Jr., 3,723,790.
Flannery, James E.; and Lemoine, Jacqg, 3,723,144.
Frazier, John F.; and Ziver, Caro M., 3,723,935.
Howell, Robert G.; and Panzarino, Joseph N., 3,723,080.
Knowles, Daniel H.; Lapinsky, George D.; Overman, Kenneth T.; and Simon, Raphael A., 3,723,082.

Wise, Warren M., 3,723,281.

Cornsweet, Tom N., to Stanford Research Institute. Method and apparatus for discriminating against masking reflections. 3,723,648, Cl. 178-6.800.

Correia, Yves, to Pechiney-Saint-Gobain. Stabilization of saturated halogenated aliphatic hydrocarbons. 3,723,331, Cl. 252-165.000.

Corsmeier, Robert J., to General Electric Company. Fastening device and cooperating tool means. 3,722,058, Cl. 29-200.00d.

Costa, Peter F.; and Coughlan, Edward H., to Polaroid Corporation. Folding camera. 3,722,389, Cl. 95-39.000.

Cottom, Truman W., to Mabry, Ray W. Contact lens edge finishing machine. 3,722,143, Cl. 51-5.000.

Cotton, Ronald K.; and Rae, Barney O., to Cutler-Hammer, Inc. Motor control system. 3,723,841, Cl. 318-574.000.

Couche, Raymond Arthur. Process for extracting oil from palm fruits and olives. 3,723,487, Cl. 260-412.400.

Coughlan, Edward H.: *See—*
Costa, Peter F.; and Coughlan, Edward H., 3,722,389.

Coulson, Dale Robert, to Du Pont de Nemours, E. I., and Company. Bis (2,3-dimethylenebutyl)-cyanomethane compounds and their preparation. 3,723,500, Cl. 260-465.80r.

Courchesne, Germain. Combined intake and exhaust ventilator. 3,722,395, Cl. 98-33.000.

Cowland, Frederick Claud, to Plessey Handel und Investments A.G. Percutaneous myo-electrode system. 3,722,005, Cl. 3-1.100.

CPC International Inc.: *See—*
Hicks, James P.; Gramera, Robert E.; and Molotsky, Hyman M., 3,723,412.

Craig, Alan D.; and Lukach, Carl A., to Hercules Incorporated. Propellant charge for caseless ammunition. 3,723,203, Cl. 149-19.000.

Craig, Dwin Richardson, to Balac, Joseph F. and Tolosa, Felix P. Malleable exposure slit for a continuous strip photographic printer. 3,722,980, Cl. 355-83.000.

Craig, Richard W.: *See—*
Walker, Frank H.; and Craig, Richard W., 3,722,321.

Cramer, Howard A., to Lowrance Electronics Mfg., Corporation. Trolling motor with steering means. 3,723,839, Cl. 318-15.000.

Cramer, Roy A., Jr. Method and apparatus for storing and dispensing effervescent beverages. 3,722,756, Cl. 222-212.000.

Crane Packing Company: *See—*
Tankus, Harry, 3,722,896.

Crawford Fitting Company: *See—*
Spontelli, Leonard P., 3,722,064.

Cressman, Robert C.: *See—*
Schumacher, Walter C.; and Cressman, Robert C., 3,723,941.

Creutzburg, Gerhard: *See—*
Ackermann, Hans; and Creutzburg, Gerhard, 3,723,425.

Crick, Virlon, to United States of America, Air Force. Independent self adjusting vibration damper. 3,723,023, Cl. 416-219.000.

Crissman, Roy G.: *See—*
Greenberg, Charles B.; and Crissman, Roy G., 3,723,155.

Croce, Louis J.: *See—*
Barone, Bruno J.; and Croce, Louis J., 3,723,515.
Barone, Bruno J.; and Croce, Louis J., 3,723,518.

Cromie, Harry W., to Baxter Laboratories, Inc. Disc for heart valves. 3,722,004, Cl. 3-1.000.

Crompton & Knowles Corporation: *See—*
Paul, Frederick W., 3,723,990.

Cronin, Timothy H.; and Hess, Hans-Jurgen E., to Pfizer Inc. Piperazino isoquinoline bronchodilators. 3,723,434, Cl. 260-268.00c.

Crooke, Robert Curtis; and Hilsabeck, Carl E., to Global Marine Inc. Load indicator for mooring line. 3,722,268, Cl. 73-143.000.

Crooks, James W., to Allis-Chalmers Corporation. Power shift planetary transmission. 3,722,300, Cl. 74-15.630.

Crooks, James W., to Allis-Chalmers Corporation. Power shift planetary and countershaft transmission. 3,722,301, Cl. 74-15.630.

Croon, Alexander. Travel case. 3,722,564, Cl. 150-39.000.

Crosslen, Louis John, to Mayer, Frank, and Associates, Inc. Theft-proof merchandise display having a hanging-type holder. 3,722,699, Cl. 211-169.000.

Crouse, William G.; and Jones, John E., to International Business Machines Corporation. Method and device for reading and decoding a high density self-clocking bar code. 3,723,710, Cl. 235-61.11e.

Crovetti, Aldo J.: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., 3,723,523.

Crowder, Wyly Kenneth. Pneumatic systems transit. 3,722,427, Cl. 104-155.000.

Cullen, John S. Desiccant capsule and package embodying the same. 3,722,188, Cl. 55-384.000.

Cummings, Gilbert A., to Peters & Co., Inc. Shelf. 3,722,700, Cl. 211-153.000.

Cumpu-Sort Systems, Inc.: *See—*
Vulcano, Vincent N., 3,722,342.

Cunha, Harold; Dickman, William M.; and Robbins, Daniel H., to Itek Corporation. Copying apparatus having cassette and cutting means. 3,722,999, Cl. 355-45.000.

Cunningham, James E.: *See—*
Pitegoff, Alexander D.; Wernikoff, Robert E.; and Cunningham, James E., 3,723,649.

Cuorato, John; and Stull, Charles V., to I-T-E Imperial Corporation. Telescoping outdoor switchboard and aisle sections. 3,723,824, Cl. 317-120.000.

Cupler, John A., II. Method for conducting machining and assembly operations. 3,722,078, Cl. 29-557.000.

Curran, John R., to Foxboro Company, The. Cage valve assembly. 3,722,860, Cl. 251-332.000.

Currey, John E.; and Ruthel, Walter W., to Hooker Chemical Corporation. Catholyte recirculation in diaphragm chlor-alkali cells. 3,723,266, Cl. 204-98.000.

Curtis, Lawrence A.; and Bonsky, Elmer C., to T.A.D. Avanti Inc. Telephone answering system. 3,723,656, Cl. 179-2.00a.

Curtiss-Wright Corporation: *See—*
Berkowitz, Murray, 3,722,480.

Cutler-Hammer, Inc.: *See—*
Cotton, Ronald K.; and Rae, Barney O., 3,723,841.

Cyba, Henryk A., to Universal Oil Products Company. Novel flame retardant compositions of matter. 3,723,383, Cl. 260-41.00b.

Cycle Equipment Company: *See—*
Lawrence, Frederick J.; and Lawrence, Joseph L., 3,722,792.

Daga, Giorgio Abbate; Cerrocchi, Lino; and Fracassi, Pietro, to Montecatini Edison S.p.A. and Guardigli S.p.A. System for protecting electrolytic cells against short circuits. 3,723,285, Cl. 204-228.000.

Dahlgren, Jens Karl Adolf, to Stenberg-Flygt AB. Pumping device with self centering spherical seating surfaces. 3,722,757, Cl. 222-385.000.

Dahlinger, Rodney J., to Hughes Aircraft Company. High efficiency current feedback control system. 3,723,756, Cl. 307-106.000.

Dahlquist, John A.; and Brodie, Ivor, to Photophysics, Inc. Liquid toning apparatus. 3,722,453, Cl. 118-246.000.

Dahlquist, John A., to Photophysics, Inc. Data terminal system having improved means for producing and delivering flexible record sheets. 3,722,995, Cl. 355-13.000.

Dahms, Harald. Photoelectric endpoint detection. 3,723,062, Cl. 23-230.00r.

Dai Nippon Toryo Co., Ltd.: *See—*
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo (said Wakimoto, Tugukuni, and said Kano assors. to), 3,723,372.

Daido Seiko Kabushiki Kaisha: *See—*
Kato, Tetsuo; and Kusaka, Katsusi, 3,723,103.

Daigle, Donald J.: *See—*
Donaldson, Darrell J.; and Daigle, Donald J., 3,723,057.

Daiichi Seiyaku Co., Ltd.: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.

Daikin Hogyo Co., Ltd.: *See—*
Sawai, Satoshi; Maekawa, Jusaburo; and Tanaka, Yoshimi, 3,723,024.

Daimler-Benz Aktiengesellschaft: *See—*
Hartmann, Hans Otto; and Schmidt, Karl-Walter, 3,722,493.
Schiesterl, Gerhard, 3,722,243.
Wilfert, Karl, 3,722,320.

Dainippon Ink and Chemicals, Incorporated: *See—*
Nagata, Yoshiaki; Higo, Yatuhiro; Hibabayashi, Satoshi; and Morozimi, Eiichi, 3,723,153.

Dall'Asta, Leone: *See—*
Gradnik, Boris; Pedrazzoli, Andrea; and Dall'Asta, Leone, 3,723,453.

Dambrine, Francis; and Gross, Gilles, to Fives Lille-Cail. Calcining phosphate minerals. 3,723,597, Cl. 263-32.00r.

Damm, Charles C.: *See—*
Gordon, Frank J.; and Damm, Charles C., 3,723,730.

Damon, Melvin H., to Electronic Navigation Industries Incorporated. Acoustic navigation system. 3,723,957, Cl. 340-5.00r.

Dan River Inc.: *See—*
Spangler, Myrtle Joanne, 3,723,377.

Dand, Harvey Stewart, to McDonnell Douglas Corporation. Store release mechanisms. 3,722,944, Cl. 294-83.000.

Daniels, Charles R.; and Kinzer, Kenneth D., to Ferromagnetics, Inc. High voltage power supply for copying apparatus or the like. 3,723,850, Cl. 321-47.000.

Dano Modules, Inc.: *See—*
Comm, Daniel, 3,722,168.

Dapprich, William R. Carburetor utilizing surface tension and capillary action. 3,722,837, Cl. 261-34.00a.

Dargatz, Theodore A.; and Hirschberg, Erwin E., to Eclipse Fuel Engineering Co. Pilfer-proof valve. 3,722,853, Cl. 251-110.000.

Darko, Laszlo L., to Ciba-Geigy Corporation. 2-Hydroxy and 2-carbamyloxy derivatives of 1,1,1-trichloro-3-carbamyloxyalkanes in a composition and method for effecting muscle relaxation. 3,723,624, Cl. 424-300.000.

Darula, Andrew J.: *See—*
Knight, John D.; and Darula, Andrew J., 3,722,571.

Data Time, Inc.: *See—*
Richey, Charles F., 3,723,675.

Daum, Gerhard: *See—*
Blumenfeld, Georg; Daum, Gerhard; and Richtzenhain, Hermann, 3,723,468.

Dauwalter, Charles R.: *See—*
Gilinson, Philip J., Jr.; and Dauwalter, Charles R., 3,722,262.

Davidson, Arthur R.; Haubner, John E.; and White, George A., to Lamb-Weston, Inc. Apparatus for processing edible foodstuffs. 3,722,401, Cl. 99-407.000.

Davidson, William E., to General Electric Company. Steam nozzle iron. 3,722,117, Cl. 38-77.830.

Davies, Guy Edward; and Wilson, Christopher Guy Scott, to Plessey Handel und Investments A.G. Fluidic apparatus, more particularly for the determination of pressure ratios. 3,722,521, Cl. 137-818.000.

Davies, James Francis: *See*—
Cheng, Wai Ming; Davies, James Francis; and Stuttard, Leonard Wallace, 3,723,326.

Davis, Earl K.; and Hansen, Kent W., to Motorola, Inc. Glasses for encapsulating semiconductor devices. 3,723,835, Cl. 317-234.00r.

Davis, Pauls; and Vogt, Herwart C., to BASF Wyandotte Corporation. Chloronitrosylated polymers and a process for the preparation thereof. 3,723,404, Cl. 260-94.9gb.

Davis, Robert H., to Mobil Oil Corporation. Lubricant for metal working. 3,723,314, Cl. 252-33.400.

Davis, Wayne Edward, to Manville-Johns Corporation. Programmable irrigation computer. 3,723,753, Cl. 307-41.000.

Dawidowicz, Jan, to Warner-Lambert Company. Guard bar for safety razors. 3,722,090, Cl. 30-32.000.

Dawson, John Burt: *See*—
Heseltine, Robert William; and Dawson, John Burt, 3,723,349.

Dayco Corporation: *See*—
Cooper, Jerry W., 3,722,962.
Haley, John S.; and Cooper, Jerry W., 3,722,961.

Dayton Steel Foundry Company, The: *See*—
Walther, William D., 3,722,914.

D.B.F.D. Enterprises: *See*—
Johnson, Dale W.; Grounds, Robert B.; and Langford, Donald C., 3,723,851.

DCA Food Industries, Inc.: *See*—
Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., 3,723,137.

D.D.I. Communications, Inc.: *See*—
Huebner, Werner P. E.; and Long, Robert C., 3,723,658.

De Filippis, Tullio: *See*—
Lyons, James Francis; and De Filippis, Tullio, 3,723,955.

De Gueldre, Jean Martha: *See*—
Natens, Luc Yves; and De Gueldre, Jean Martha, 3,722,274.

De Montigny, Armand: *See*—
Moller, Friedrich; Roegler, Manfred; Simmler, Walter; and De Montigny, Armand, 3,723,492.

De Priester, Donald Jack; Horney, David C.; and Mangels, Robert H., to Hon Industries Inc. Power driven material handling truck. 3,722,613, Cl. 180-52.000.

De Simone, David N.; and Catroppa, Frank A., to United States of America, Navy. Dual visor headgear. 3,721,994, Cl. 2-6.000.

De Viney, Terrence E., to Square D Company. Magnet controller. 3,723,825, Cl. 317-123.000.

De Vries, Gerrit: *See*—
Karig, Horace Edmund; and De Vries, Gerrit, 3,722,445.

De Vries, Louis, to Chevron Research Company. Lubricant containing an alkali metal ketone salt and acrylonitrile. 3,723,501, Cl. 260-465.900.

Deeds, Douglas; and Rosengrant, Barry L., to Architectural Pottery. Fiberglass filing cabinet. 3,722,972, Cl. 312-305.000.

Deegan, James J.: *See*—
Kienle, Raymond P.; Bass, Gerald R.; Deegan, James J.; and Kiwiets, Johannes, 3,722,657.

Deering Milliken Research Corporation: *See*—
Hooper, Gilman S.; and Springer, Alois H., 3,723,055.

Defalco, Ralph L.: *See*—
Bende, Albert J.; and Defalco, Ralph L., 3,722,054.

Delapierre, Gilles: *See*—
Michaud, Jean-Francois; and Delapierre, Gilles, 3,723,866.

Dellecker, Raymond Whyte; Greason, William Wallace, III; Hayden, Paul Ross; and Weiner, David William, to Bell Telephone Laboratories, Incorporated. Multifunctional scanner-counter circuit. 3,723,661, Cl. 179-18.0fg.

Delobelle, Emile Jean, to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes. Radial-ply pneumatic tire. 3,722,567, Cl. 152-354.000.

Deltrol Corporated: *See*—
Harris, John L., 3,722,294.

Deltrol Corporation: *See*—
Harris, John L., 3,723,676.

Demilie, Paul: *See*—
Lecuit, Paul; and Demilie, Paul, 3,723,596.

Demny, Werner, to Kocks, Friedrich. Rolling mills and methods. 3,722,250, Cl. 72-224.000.

Denis, Marcel: *See*—
Francois, Maurice; and Denis, Marcel, 3,723,806.

Dennison, John J., to Arrow-Hart, Inc. Grounding clip electric receptacles. 3,723,942, Cl. 339-14.00r.

Denslow, Keith R.: *See*—
Skochdopole, Richard E.; and Denslow, Keith R., 3,723,240.

Densmore, Richard M. Segmented retaining ring assembly. 3,722,374, Cl. 92-128.000.

Dent, Robert K. Method of swage joining a metallic tube to an insert. 3,722,076, Cl. 29-516.000.

D'Ercole, Anthony C.; Ferris, James E.; and Schwardt, David N., to Eastman Kodak Company. Cartridge opening device. 3,722,055, Cl. 29-200.00d.

Derdivanis, John P.: *See*—
Block, Philip L.; and Derdivanis, John P., 3,723,613.

Derouineau, Rene. Tranquilizing device. 3,722,501, Cl. 128-1.00c.

Desai, Shrikrishna N.: *See*—
Morgan, Lee W.; and Desai, Shrikrishna N., 3,723,323.

Deslongchamps, Pierre, to Universite de Sherbrooke. Oxidation of sugars. 3,723,506, Cl. 260-484.00r.

Desnos, Monique: *See*—
Malen, Charles; Desnos, Monique; and Poignant, Jean-Claude, 3,723,466.

Detch, Lewis. Locking means for fluorescent lamps. 3,723,945, Cl. 339-54.000.

Deutsche Edelsthlwerke Geseelschaft mit beschrankter Haftung: *See*—
Frehn, Fritz, 3,723,077.

DeVries, Adrian J.: *See*—
Adler, Robert; DeVries, Adrian J.; and Dias, Fleming, 3,723,915.

DeVries, Jaap: *See*—
Blasse, George; and DeVries, Jaap, 3,723,787.

Dexter, Martin; Spivack, John D.; and Steinberg, David H., to Ciba-Geigy Corporation. Metal derivatives of 3,5-di-t-butyl-4-hydroxyphenylpropionic acid. 3,723,489, Cl. 260-429.700.

Dexter, Martin; Spivack, John D.; and Steinberg, David Herbert, to Ciba-Geigy Corporation. 3,5-Dialkyl-4-hydroxyphenylalkanoic acid esters of 3-hydroxy-2,2-dimethylpropyl 3-hydroxy-2,2-dimethylpropionate. 3,723,503, Cl. 260-473.00s.

Diablo Systems, Inc.: *See*—
Gabor, Andrew, 3,723,980.

Diamond International Corporation: *See*—
Struble, Glenn E., 3,722,754.
Struble, Glenn E., 3,722,767.

Diana, Guy D., to Sterling Drug Inc. 3-(substituted amino)-1H-isoindoles. 3,723,421, Cl. 260-240.00f.

Dias, Fleming: *See*—
Adler, Robert; DeVries, Adrian J.; and Dias, Fleming, 3,723,915.

Diaz, Simon J. Well head casing seal. 3,722,587, Cl. 166-88.000.

Diaz, Simon J. Well head casing seal. 3,733,587, Cl. 166-88.000.

Dibble, Vaughn R., Jr.: *See*—
Hill, Jack O.; Fridge, David S., Jr.; and Dibble, Vaughn R., Jr., 3,722,014.

Dickert, George H. Snowless skis. 3,722,900, Cl. 280-7.130.

Dickey-john Corporation: *See*—
Fathauer, George H.; and Fathauer, David F., 3,723,989.

Dickman, William M.: *See*—
Cunha, Harold; Dickman, William M.; and Robbins, Daniel H., 3,722,999.

Dictaphone Corporation: *See*—
Kendall, Trevor William, 3,722,810.

Diehl, Francis [illegible], to Procter & Gamble Company, The. Detergent compositions containing carboxylated polysaccharide builders. 3,723,322, Cl. 252-89.000.

Diekman, John [illegible] Siddall, John B., to Zoecon Corporation. Certain ethers and [illegible] of 1,2,3-benzotheizole. 3,723,447, Cl. 260-304.000.

Dierks & Sohne: *See*—
Bialas, Horst; and Lindenthal, Friedrich, 3,722,831.

Diesel Kiki Kabushiki Kaisha: *See*—
Ohtani, Yoshio, 3,722,485.

Dietsche, Erich: *See*—
Wissler, Bernhard; and Dietsche, Erich, 3,723,015.

Dietsche, Roman, Firma: *See*—
Wissler, Bernhard; and Dietsche, Erich, 3,723,015.

Dinsdale, Vern Thomas; Redd, Russell, Jr.; and Meyer, Robert E., to Thiokol Chemical Corporation. Castable illuminant flare composition. 3,723,206, Cl. 149-19.000.

Dionne, Yvon Onil: *See*—
Bouffard, Jean; and Dionne, Yvon Onil, 3,722,770.

Ditschler, Hans Jorgen: *See*—
Hans, Joachim; Ditschler, Hans Jorgen; and Russeler, Gerhard, 3,722,359.

Dixon, Harold G.; and Ferrekk, Harold M., to Sperry Rand Corporation. Marine engine room monitor and control system. 3,723,750, Cl. 307-64.000.

Dobinson, Frank, to Monsanto Company. Aromatic amide-hydrazide copolymer. 3,723,380, Cl. 260-32.6nt.

Dobychin, Fedor Nikolaevich: *See*—
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.

Dohgane, Iwao: *See*—
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Dohmeier, Hans Otto, to Dome Inventions (Proprietary) Limited. Tires. 3,722,566, Cl. 152-169.000.

Dolce, Samuel L. Jack and lock. 3,722,862, Cl. 254-10.500.

Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra.Method of producing 1,4-cis-polybutadiene and cis-copolymers of butadiene. 3,723,400, Cl. 260-82.100.

Domco Industries Limited: *See*—
Maclaine, Ian A.; and Semeniw, Orest T., 3,723,576.

Dome Inventions (Proprietary) Limited: *See*—
Dohmeier, Hans Otto, 3,722,566.

Domin, Heinz. Silent butler. 3,722,703, Cl. 211-178.00r.

Donahue, Thomas H., to International Telephone and Telegraph Corporation. Device for measurement of pulse-to-pulse carrier frequency shift. 3,723,870, Cl. 324-82.000.

Donaldson, Darrell J.; and Daigle, Donald J., to United States of America, Agriculture. Process for stabilizing organophosphorus solutions and imparting rot and flame resistance to organic textile materials. 3,723,057, Cl. 8-116.00p.

Donermeyer, Donald D.: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,723,381.

Dopera, Rudolph. Stringed musical instrument body construction. 3,722,345, Cl. 84-291.000.

Dorma, Edward. Variable speed transmission. 3,722,326, Cl. 74-752.00b.

Dorn, Friedrich Wilhelm: *See—*
Meurer, Peter Lorenz; Dorn, Friedrich Wilhelm; and Harnisch, Heinz, 3,723,608.

Dorr-Oliver Incorporated: *See—*
Petersen, Paul I., 3,722,804.

Dougall, James R., to Minneapolis Electric Steel Castings Company. Connecting apparatus for tooth adapter assembly. 3,722,932, Cl. 287-103.00d.

Douglas, Peyton W., to Blackstone Corporation. Power rinse clothes washers. 3,722,234, Cl. 68-23.500.

Dounchis, Harry: *See—*
Volpp, Gert Paul; and Dounchis, Harry, 3,723,448.

Dover Corporation: *See—*
Wilson, Fred A.; and Sprague, Lindol H., 3,722,549.

Dow Badische Company: *See—*
Forshee, J. Harold, 3,723,709.
Koeleveld, Frans P.; Ngo, Reginald Mak; and Dury, Russell G., 3,723,811.

Dow Chemical Company, The: *See—*
Best, John S., 3,722,378.
Hatch, Melvin J.; Yoshimine, Masao; Smith, Hugh B.; and Schmidt, Donald L., 3,723,386.
McCormick, Robert J.; and Fitzgerald, Charles E., 3,722,731.
McFadden, Russell Thomson, 3,723,550.
Moore, Zack J., 3,722,815.
Pashak, John F., 3,723,282.
Roberts, Reginald F., Jr., 3,723,544.
Ruetman, Sven H., 3,723,431.
Sargent, John A.; and Straub, Francis W., 3,722,695.
Skochdopole, Richard E.; and Denslow, Keith R., 3,723,240.
Tomalia, Donald A.; and Paige, Janet N., 3,723,451.

Dow Corning Corporation: *See—*
Berry, Ronald H., 3,723,497.
Butler, Anthony J., 3,723,318.
Mink, Alan E.; and Mitchell, Darrell D., 3,723,567.

Dowbenko, Rostyslaw, to PPG Industries, Inc. Thermosetting polymers derived from compounds of five and six membered cyclic alpha, beta-unsaturated ethers. 3,723,398, Cl. 260-80.720.

Doyle, William Carter, Jr., to Gulf Research & Development Company. S-acyl derivatives of 3-mercapto-2-chloropropyl N, N-dialkylthiolcarbamates. 3,723,493, Cl. 260-455.00a.

Draaijer, Harm: *See—*
Bos, Julius Goeman; Draaijer, Harm; and Duyve, Jan, 3,723,191.

Drake, Crandell & Batchelder, mesne: *See—*
Burton, Jay E., 3,723,881.

Drakes, Russell J.: *See—*
Pfitzer, Robert L.; and Drakes, Russell J., 3,722,649.

Draper, James E.; and Rejsa, Jack J., to Pillsbury Company, The. Apparatus for cutting and removing meat from bones. 3,722,032, Cl. 17-1.00g.

Drasch, Josef: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.

Dravo Corporation: *See—*
Mevissen, Ernst A., 3,722,895.
Savage, Elton S.; and Heaney, Donald F., 3,722,836.

Dresser Industries, Inc.: *See—*
Berry, Robert F.; and Blackwell, Henry W., 3,722,053.
Blackwell, Henry Wayne, 3,722,527.

Dresser Industries, Inc., mesne: *See—*
Zurstadt, Herbert J., 3,723,936.

Drevitch, Nolan A., to Polaroid Corporation. Portable camera support device with aiming structure. 3,722,393, Cl. 95-86.000.

Driver, Wilbur B., Co.: *See—*
Schlenker, Juergen; and Wang, Teh Po, 3,723,106.

Druin, Melvin, to Celanese Corporation. Production of resin impregnated fibrous graphite ribbons. 3,723,157, Cl. 117-46.0cb.

Druin, Melvin L.; Ferment, George R.; and Rao, Velliyur N. P., to Celanese Corporation. Surface modification of carbon fibers. 3,723,150, Cl. 106-307.000.

Du Pont de Nemours, E. I., and Company: *See—*
Adelman, Robert Leonard, 3,723,570.
Apotheker, David; and Van Gulick, Norman M., 3,723,348.
Carmichael, Keith Stewart; and Lester, Joseph Thomas, Jr., 3,722,726.
Coulson, Dale Robert, 3,723,500.
England, David Charles, 3,723,470.
Evans, William L., 3,723,204.
Haskell, Vernon Charles, 3,723,571.
Hauser, William, 3,723,121.
Hoeschele, Guenther Kurt, 3,723,568.
Hoeschele, Guenther Kurt, 3,723,569.
Hoh, George L. K.; and Tuites, Donald E., 3,723,397.
Hovermale, Ralph Allen; Ostapchenko, George Joseph; and Yang, Hung Han, 3,723,583.
Hummel, Karl Frederick, 3,723,120.
Kirkland, Joseph J.; and Yates, Paul C., 3,722,181.
Lee, Kyu Tai; and Whitney, Joel G., 3,723,504.
Nyce, Jack Leland, 3,723,387.
Rushmere, John Derek, 3,723,260.
Rushmere, John Derek, 3,723,262.
Schlatter, Rudolph; and Adams, Charles De Witt, 3,723,505.
Ulery, Harris Ellsworth, 3,723,317.

Du Pont of Canada, Limited: *See—*
Bergevin, Jean Paul; and Kuester, Karl Otto, 3,722,174.

Ducharme, Jacques. Air cushion games. 3,722,888, Cl. 273-126.00r.

Duckworth, James J., to Ballantine Laboratories, Inc., mesne. True RMS to DC converters. 3,723,845, Cl. 321-1.500.

Duerksen, Arnold, to Cochran Western Corporation. Tractor-trailer side tow construction. 3,722,921, Cl. 280-473.000.

Dumbaugh, William H., Jr. Infrared transmissive lead bismuthate glasses. 3,723,141, Cl. 106-47.00r.

Dumbaugh, William H., Jr., to Corning Glass Works. Electrical lamp or tube comprising copper-coated nickel-iron alloy electrical current conductors and a glass enclosure. 3,723,790, Cl. 313-221.000.

Duncan, Damon H.; and Jacobson, Peter E., to Sperry Rand Corporation. Fluid bearing gyroscope. 3,722,297, Cl. 74-5.600.

Dunham, John C. Brake bleeding tool. 3,722,266, Cl. 73-132.000.

Dunn, Alire R.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alire R., 3,723,001.

Durand, Philippe, to Societe Anonyme D.B.A. Reciprocating fluid motor. 3,722,364, Cl. 91-3.000.

Durmann, George J.: *See—*
Longo, Frank N.; and Durmann, George J., 3,723,165.

Durrell, William Sandford: *See—*
Suryanarayana, Yelogondahally Subrananiam; and Durrell, William Sandford, 3,723,065.

Dury, Russell G.: *See—*
Koeleveld, Frans P.; Ngo, Reginald Mak; and Dury, Russell G., 3,723,811.

Duyve, Jan: *See—*
Bos, Julius Goeman; Draaijer, Harm; and Duyve, Jan, 3,723,191.

Dvolaitzky, Frajda; and Cognacq, Jean-Claude, to Societe Civile Auguil. Derivatives of dibenzo(a,d) 5H-cycloheptene, method of preparation, and application thereof. 3,723,420, Cl. 260-240.0tc.

Dwyer, James L.; and Reiman, Peter A., to Milliport Corporation. Spiral-wound filter. 3,722,696, Cl. 210-435.000.

Dykmans, Maximiliaan Jacobus. Protective arrangement for exposed tensioned cable. 3,722,158, Cl. 52-224.000.

Dyna Magnetic Devices, Inc.: *See—*
Sebesta, George J.; and Mellen, Arthur J., Jr., 3,723,670.

Dynamit Nobel Aktiengesellschaft: *See—*
Blumenfeld, Georg; Daum, Gerhard; and Richtzenhain, Hermann, 3,723,468.
Ismail, Roshdy, 3,723,172.

Dynasafe Equipment Limited: *See—*
Esner, Mark Edward, 3,722,909.

Dyonics, Incorporated: *See—*
Van Iderstine, Theodore J.; and Bonnell, Leonard J., 3,723,722.

Eastech, Inc.: *See—*
Rodely, Alan E.; and Fussell, Theodore J., 3,722,275.

Eastman Kodak Company: *See—*
Bell, Alan; and Jackson, Winston J., Jr., 3,723,388.
Bradley, John J.; Schauffele, Carl N.; and St. Clair, John Q., II, 3,723,650.
Brown, Edward A., 3,722,808.
D'Ercole, Anthony C.; Ferris, James E.; and Schwardt, David N., 3,722,055.
Jenkins, Philip W., 3,723,422.
Kamp, Leonard F.; and Ewald, William P., 3,722,385.
Mee, John D.; and Heseltine, Donald W., 3,723,419.
Mose, John E., 3,722,998.
Oliver, Gene L., 3,723,154.
Perez-Alberne, Evelio A., 3,723,417.
Price, Harry J., 3,723,126.
Wood, Edwin L.; and Gibson, Roger E., 3,723,147.

Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener device. 3,722,672, Cl. 206-79.000.

Ebeling, Olavi; and Lunden, Risto. Rain water drain pipe or similar for a building. 3,722,532, Cl. 137-357.000.

Ebrahimi, Jalal, to Bell Canada-Northern Electric Research Limited. Transmission gating circuit. 3,723,760, Cl. 307-203.000.

Eccles, Arnaud Michael; and Potter, Norman Leonard, to English Electric Company Limited, The. Semi-conductor devices. 3,723,768, Cl. 307-252.001.

Ecker, George Franklin: *See—*
Bohrer, Thomas Carl; Ecker, George Franklin; and Chen, David Hsiao Tsung, 3,723,592.

Eclipse Fuel Engineering Co.: *See—*
Dargatz, Theodore A.; and Hirschberg, Erwin E., 3,722,853.

Economy, James; and Clark, Rodger A., to Carborundum Company, The. Method for production of novolac fibers. 3,723,588, Cl. 264-83.000.

Edelcreek, Gilbert. Telephone lock. 3,723,671, Cl. 179-189.00r.

Edenhofer, Albrecht; and Spiegelberg, Hans, to Hoffmann-La Roche Inc. Process for the preparation of [3-(4-phenyl)-1-2H-3,6-dihydropyridyl]-propoxy or propylthio-anilides or derivatives thereof. 3,723,445, Cl. 260-295.0am.

Eder, Ulrich; and Sauer, Gerhard, to Schering Aktiengesellschaft. Novel benzopyran derivatives. 3,723,471, Cl. 260-345.200.

Ederton, William H., to Smith Kline & French Laboratories. Poly (N-cyclo alkylaminomethyl) cyclopentanes. 3,723,526, Cl. 260-563.00r.

Edhlund, Arthur J., to Minnesota Mining and Manufacturing Company. Microfiche positioning apparatus. 3,722,991, Cl. 353-27.000.

Edholm, Sven Olof. Device for electric incinerator dry closets. 3,722,006, Cl. 4-131.000.

Edholm, Sven Olof. Coupling means for electric incinerator lavatories. 3,723,828, Cl. 317-141.00r.

Edlund, Karl Knut Harry. End wall for drums and other containers for liquid or solid state products. 3,722,732, Cl. 220-66.000.

Edwards, Carl D.: *See*—
Lummus, James L.; and Edwards, Carl D., 3,723,311.

Eftax, Daniel S. P.: *See*—
Brown, Lloyd H.; Eftax, Daniel S. P.; Everett, George S.; and Oldham, James R., 3,723,368.

Egnaczak, Raymond Keith, to Xerox Corporation. Materials application apparatus. 3,722,993, Cl. 355-3.000.

Ehlers, Kenneth W.; Brown, Ian G.; and Lietzke, Alan F., to United States of America, Atomic Energy Commission. Laser energized plasma source. 3,723,703, Cl. 176-1.000.

Eichhorst, Ingo, to Licentia Patent-Verwaltungs-G.m.b.H., mesne. Switch spring for a relay. 3,723,688, Cl. 200-166.00c.

Eisai Co., Ltd.: *See*—
Hirose, Horiyasu; and Souda, Shigeru, 3,723,457.

Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., to GAF Corporation. Phosphate esters of ethers of thiol substituted phenols. 3,723,578, Cl. 260-949.000.

Eklund, Phillip R., to United States of America, Air Force. Ball and roller bearing retainer improvement for high speed operation. 3,722,969, Cl. 308-193.000.

Electro Signal Lab., Inc.: *See*—
Steele, Donald F., 3,723,747.

Electromask, Inc., mesne: *See*—
Fox, Wayne L., 3,722,996.

Electronic Image Systems Corporation: *See*—
Pitegoff, Alexander D.; Wernikoff, Robert E.; and Cunningham, James E., 3,723,649.

Electronic Navigation Industries Incorporated: *See*—
Damon, Melvin H., 3,723,957.

Elitex, Zavody textilniho strojirenstvi generalni reditelstvi: *See*—
Indra, Jaromir; and Opatril, Vaclav, 3,722,552.

Elliott Brothers (London) Limited: *See*—
Jablonski, Jan, 3,722,279.

Elliott, Charles Henry. Apparatus for producing aluminum from alumina. 3,723,287, Cl. 204-243.00r.

Ellis, Charles W., to Lorain Products Corporation. Phase responsive control circuit. 3,723,888, Cl. 328-134.000.

Elmslie, Keith W.: *See*—
Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., 3,723,276.

Eloy, Jacques: *See*—
Chopin, Jean; and Eloy, Jacques, 3,722,221.

Elsas, Norman E., to Nemo Industries, Inc. Cloth cutting and hemming method and apparatus. 3,722,435, Cl. 112-121.110.

Elstermann, Calus-Heinrich: *See*—
Hahnkamm, Volker; Broja, German; Brandle, Karl; and Elstermann, Calus-Heinrich, 3,723,611.

Eltra Corporation: *See*—
Swift, Thomas E.; and Brayley, Elwin J., 3,722,488.

Emery, Raymen F.: *See*—
Knight, Theodore L.; and Emery, Raymen F., 3,722,299.

Emmasingel, Johannus Godefridus: *See*—
Lambertus, Wanmaker Willem; and Emmasingel, Johannus Godefridus, 3,723,339.

Empson, Herbert G. Pipeline suspension system. 3,722,225, Cl. 61-72.100.

Enckler, Albert J., to Keeler & Dunkel, Inc. Display fixture for portable electrical articles. 3,722,843, Cl. 248-300.000.

Endo, Souichiro: *See*—
Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, 3,723,222.

Engelhard Minerals & Chemical Corporation: *See*—
Swanson, David B.; and Miller, Barry S., 3,723,174.

Engelmann, Roger F., to Case J. I., Company. Flow divider valve. 3,722,524, Cl. 137-101.000.

Engineering Physics Company: *See*—
Marsh, Lawrence B., 3,722,281.

England, David Charles, to Du Pont de Nemours, E. I., and Company. 3,4-Difluoro-α-pyrones having a 6-aromatic substituent. 3,723,470, Cl. 260-343.500.

English Electric Company Limited, The: *See*—
Eccles, Arnaud Michael; and Potter, Norman Leonard, 3,723,768.
Gunnell, Geoffrey Herbert Arthur; and Shaw, Frank Derek, 3,722,269.

Enka Glanzstoff AG: *See*—
Werner, Helmut; and Stapp, Hans, 3,723,238.

Enomoto, Akihiro: *See*—
Araya, Kenji; Enomoto, Akihiro; Nishina, Akira; and Yamaguchi, Masahiro, 3,722,490.

Entner, Bernard J.: *See*—
Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., 3,723,137.

Environmental Research & Technology, Inc.: *See*—
Blau, Henry H., Jr., 3,723,731.

Envirotech Corporation: *See*—
Rinecker, Ulf F., 3,722,582.

Enzetti, Eugenio. False fingernail classifier. 3,722,104, Cl. 33-174.00d.

Epple, Peter C. Fluid switching valve. 3,722,525, Cl. 137-106.000.

Epstein, Norman. False eyelash applicator. 3,722,519, Cl. 132-88.700.

Erdolchemie Gesellschaft mit beschrankter Haftung: *See*—
Kohler, H. Dieter; Schnuchel, Gunther; and Scherb, Helmut, 3,723,551.

Erhard, Werner: *See*—
Storck, Herder; and Erhard, Werner, 3,722,865.

Erickson, Alve J.; and Mix, Thomas W., to Merix Corporation. Vapor-liquid contacting. 3,722,839, Cl. 261-111.000.

Eriksson, Olle: *See*—
Lee, Lars; Gavlefors, Sture; and Eriksson, Olle, 3,723,247.

Erlemann, Gustav; Sander, Manfred; and Zimmer, Gerhard, to Hoffmann-La Roche Inc. Hair spray containing vinyl ester-ester of α~β-unsaturated mono-or dicarboxylic acid copolymer. 3,723,616, Cl. 424-47.000.

Erskine, James Brian, to Imperial Chemical Industries Limited. Silencer. 3,722,620, Cl. 181-57.000.

Erteszek, Olga, to Olga Company. Underwire bra having self-adjusting fit. 3,722,513, Cl. 128-465.000.

ESB Incorporated: *See*—
Oakley, Daniel C., 3,723,181.
Venuto, C. Joseph, 3,723,182.

Escoa Fintube Corporation: *See*—
Boose, Robert Carl; Weaver, Henry; and Moore, Harry, 3,723,693.

Esner, Mark Edward, to Dynasafe Equipment Limited and Howard Wall Limited. Vehicle safety belts and harnesses and buckles for them. 3,722,909, Cl. 280-150.0sb.

Essar Corporation: *See*—
Olsson, Sven O., 3,722,365.

Esser, Harold Herman; and Olson, Ralph Brent, to Schneider Metal Manufacturing Co. Water distribution control for automatic ice cube maker. 3,722,227, Cl. 62-347.000.

Essex International, Inc.: *See*—
Alten, Ralph W., 3,723,925.

Esso Production Research Company: *See*—
Garcia, Juan A., 3,723,309.
Kiel, Othar M., 3,722,595.

Esso Research and Engineering Company: *See*—
Scher, Herbert I.; and Ungar, Israel S., 3,723,220.

Etherton, Ivor Howard, to Lucas, Joseph, (Industries) Limited. Preparation of layout sheets for printed wiring. 3,723,211, Cl. 156-63.000.

Ettinger, Donald H., to Warren Fastener Corporation. Welding gun means for feeding and holding head-bearing studs or the like. 3,723,700, Cl. 219-98.000.

Ettinger, Donald N., to Hit-Away, Inc. Bruise pad attachment. 3,721,992, Cl. 2-2.000.

Eucker, Robert A., to Preformed Line Products Co. Appliance for linear bodies. 3,723,636, Cl. 174-70.00r.

Eurlings, Jacobus J. M. G.; Geus, John W.; and Weterings, Cornelis A. M., to Stamicarbon N.V. Copper catalyst. 3,723,353, Cl. 252-459.000.

Evans, David, to International Nickel Company, The. Apparatus for coating and separating pellets. 3,722,464, Cl. 118-48.000.

Evans, Elfed Huw, to Lever Brothers Company. Soap tablet production. 3,723,329, Cl. 252-121.000.

Evans, William L., to Du Pont de Nemours, E. I., and Company. Flexible high-velocity explosive. 3,723,204, Cl. 149-19.000.

Everest, Frank G.; and Albery, Raymond L., to British Aircraft Corporation, Limited. Rangefinders. 3,723,002, Cl. 356-5.000.

Everett, George S.: *See*—
Brown, Lloyd H.; Eftax, Daniel S. P.; Everett, George S.; and Oldham, James R., 3,723,368.

Everlast World Boxing Headquarters Corporation: *See*—
Nadorf, Benjamin, 3,721,996.

Evers, William John, to International Flavors & Fragrances Inc. Method of making 2-alkylfuran-3-thiol and alkyl, (2-alkyl-3-furyl) di and trisulfides. 3,723,475, Cl. 260-347.200.

Ewald, William P.: *See*—
Kamp, Leonard F.; and Ewald, William P., 3,722,385.

Ewen, Joel J. Battery feed and ring trip relay circuit. 3,723,663, Cl. 179-84.00r.

Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 3,723,060.

Exotech Incorporated: *See*—
Hall, James M.; and Clipp, Louis L., 3,722,819.

Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, to Koninklijke Industrielle Maatschappij Noury & Van Der Lande N.V. Stabilized dibenzoyl peroxides polymer initiator compositions. 3,723,336, Cl. 252-186.000.

Ezhkov, Alexandr Borisovich: *See*—
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, 3,723,267.

Ezquerra, Raymond. Vehicle passenger safety device. 3,722,951, Cl. 297-390.000.

Fa. BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H.: *See—*
Noe, Oskar, 3,722,776.

Factory Mutual Research Corporation: *See—*
Friedman, Raymond, 3,722,597.
Livingston, William L., 3,722,596.

Fagaly, Robert L.: *See—*
Poling, Dan W.; Calkins, Edward E.; and Fagaly, Robert L., 3,723,046.

Fairbanks, Theodore H., to FMC Corporation. Web stretching method. 3,723,438, Cl. 264-289.000.

Fairchild Camera and Instrument Corporation: *See—*
Podell, Jack F.; and Whelton, Robert M., 3,723,258.

Falconer, Errol Linton, to Canadian Industries Limited. Nitrocellulose-nitric ester explosives composition containing hydroxyalkyl ether of a polysaccharide. 3,723,208, Cl. 149-94.000.

Falevitch, Leonard A.: *See—*
Steinhauer, Roger C.; Falevitch, Leonard A.; and Church, David R., 3,723,376.

Falleson, John A. Rotating paint scraper. 3,722,022, Cl. 15-236.00r.

Fancher, Llewellyn W., to Stauffer Chemical Company. Phosphonamido thiazoles and their utility as insecticides. 3,723,450, Cl. 260-306.80r.

Fantl, Joel: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,723,381.

Farbenfabriken Bauer Aktiengesellschaft: *See—*
Leontaritis, Lambis; Schon, Nikolaus; and Hoffmann, Hans, 3,723,162.

Farbenfabriken Bayer Akitengesellschaft: *See—*
Niederprum, Hans; Voss, Peter; and Beyl, Volker, 3,723,512.

Farbenfabriken Bayer Aktiengesellschaft: *See—*
Brockmann, Hans; and Scheer, Martin, 3,723,411.
Buchel, Karl Heinz; Grewe, Ferdinand; and Kospers, Helmut, 3,723,622.
Fest, Christa; and Hammann, Ingeborg, 3,723,456.
Leduc, Joseph-Adrien; Konrad, Peter; and Troemel, Gerhard, 3,723,264.
Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,723,628.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
Brinkmann, Ludwig; and Herwig, Walter, 3,723,574.

Fargo, George Arthur, Jr.: *See—*
Bunce, Michael Kelly; Bush, Stanley Edward; Fargo, George Arthur, Jr.; and Saltus, George Edwin, 3,723,654.

Farkas, Joseph J.: *See—*
McLean, Robert E.; and Farkas, Joseph J., 3,722,089.

Farrell, James P., to Fastmask Company. Protecting structure. 3,722,470, Cl. 188-505.000.

Fastmask Company: *See—*
Farrell, James P., 3,722,470.

Fathauer, David F.: *See—*
Fathauer, George H.; and Fathauer, David F., 3,723,989.

Fathauer, George H.; and Fathauer, David F., to Dickey-john Corporation. Electronic planter monitor. 3,723,989, Cl. 340-259.000.

Faulk, Joseph H., to Atlantic Richfield Company. Well drilling. 3,722,608, Cl. 175-65.000.

Faulstich, Marga; and Neuroth, Norbert, to Jenaer Glaswerk Schott & Gen. Glass compositions for ultrasonic delayed action lines. 3,723,143, Cl. 106-53.000.

Faust, Jesse A.: *See—*
Haldas, Walter J.; and Faust, Jesse A., 3,723,145.

Fauth, Otto: *See—*
Bilz, Otto; and Fauth, Otto, 3,723,017.

Fawn Engineering Corporation: *See—*
Wittern, Francis A.; and Woodley, Warren D. (said Woodley assor. to), 3,722,475.

Fay, James Eugene. Method for continuous production of spiral pipe. 3,722,075, Cl. 29-477.300.

Fedco, Inc.: *See—*
Morine, Richard L.; and Hokes, James J., 3,722,560.

Federov, Evgeny Petrovich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.

Fell, Ferol S.; Goering, Lowell J.; and Long, William D., to Hesston Corporation. Transmission having direction control. 3,722,277, Cl. 74-220.000.

Feller, Adolf, Aktiengesellschaft: *See—*
Nicolas, Jean Pierre, 3,723,901.

Ferag, Fehr & Reist AG: *See—*
Wetter, Jakob, 3,722,877.

Fergason, James L.: *See—*
Taylor, Ted R.; and Fergason, James L., 3,723,346.

Ferment, George R.: *See—*
Druin, Melvin L.; Ferment, George R.; and Rao, Velliyur N. P., 3,723,150.

Ferrari, Leonard A., to Bell & Howell Company. Method for distinguishing pauses in recorded features during replay thereof. 3,723,666, Cl. 179-100.20s.

Ferrekk, Harold M.: *See—*
Dixon, Harold G.; and Ferrekk, Harold M., 3,723,750.

Ferrentino, Antonio: *See—*
Sarracino, Marcello; Ferrentino, Antonio; and Borroni, Andrea, 3,722,775.

Ferris, James E.: *See—*
D'Ercole, Anthony C.; Ferris, James E.; and Schwardt, David N., 3,722,055.

Ferro Corporation: *See—*
Fuchsman, Charles H., 3,723,426.

Ferromagnetics, Inc.: *See—*
Daniels, Charles R.; and Kinzer, Kenneth D., 3,723,850.

Ferstandig, Louis L.: *See—*
Conner, Rex C.; and Ferstandig, Louis L., 3,722,211.

Fertl, Walter H.; and Cavanaugh, R. J., to Continental Oil Company. Detecting abnormal formation pressure during drilling of a well. 3,722,606, Cl. 175-41.000.

Fest, Christa; and Hammann, Ingeborg, to Farbenfabriken Bayer Aktiengesellschaft. Pyrazolo-(thiono) phosphoric (phosphonic) acid esters. 3,723,456, Cl. 260-310.00r.

Feuz, Fritz, to Von Roll AG. Werk Bern. Travelling carriage mechanism for aerial cable cars. 3,722,632, Cl. 188-42.000.

Fiala, Ernst, to Wolf-Dieter Klink. Arrangement for quietly inflating safety gas bags in motor vehicles. 3,722,528, Cl. 137-255.000.

Fichtel & Sachs AG: *See—*
Carbon, Theo; and Kessler, Reinhard, 3,722,959.
Kempf, Reiner; and Riese, Hans-Walter, 3,722,643.
Krajs, Helmut; and Riese, Hans-Walter, 3,722,647.

Fickenscher, William E.: *See—*
Jackson, Harold W.; Olmstead, Merlin E.; and Fickenscher, William E., 3,723,714.

Fiedler, Martin, to Arrow Pneumatics, Inc. Refrigerated air dryer. 3,722,583, Cl. 165-156.000.

Field, Lamar; and Barbee, Robert B., to United States of America, Army. Organic disulfide sulfinic acid compounds. 3,723,513, Cl. 260-513.700.

Field, Nathan D.; and Williams, Earl P., to GAF Corporation. Novel anhydride interpolymers. 3,723,375, Cl. 260-29.6ta.

Fieldcrest Mills, Inc.: *See—*
MacIsaac, John T., Jr.; and Troy, James E., 3,722,442.

Finelli, Thomas M.: *See—*
Stiff, Bernard G.; and Finelli, Thomas M., 3,722,051.

Finkel, Henry, to Webster, M. C., Co., Ltd. Display sign. 3,722,120, Cl. 40-140.000.

Firestone Tire & Rubber Company, The: *See—*
Kern, William John; Bouton, Thomas Chester; and Adams, Harold Elwood, 3,723,575.

Firmenich & Cie: *See—*
Ohloff, Gunther; and Schulte Elte, Karl Heinrich, 3,723,478.
Schulte-Elte, Karl-Heinrich, 3,723,271.

First Dynamics, Inc.: *See—*
Chang, Henry M., 3,722,779.

Fischer, Hermann: *See—*
Beer, Ludwig; Fischer, Hermann; and Heil, Eduard, 3,723,391.

Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., to DCA Food Industries, Inc. Method of forming a continuous adherent batter on a food piece. 3,723,137, Cl. 99-166.000.

Fischer, Walter; and Heckmaier, Joseph, to Wacker-Chemie G.m.b.H. Process for making carbon articles. 3,723,610, Cl. 423-447.000.

Fisher, Donald J., to Xerox Corporation. Cleaning apparatus. 3,722,018, Cl. 15-1.500.

Fisher, Ivan E., to Owatonna Manufacturing Company, Inc. Conditioner roll mounting means and cushioning stop system therefor. 3,722,190, Cl. 56-1.000.

Fisher-Klosterman, Inc.: *See—*
Miczek, Gerhard, 3,722,185.

Fitzgerald, Charles E.: *See—*
McCormick, Robert J.; and Fitzgerald, Charles E., 3,722,731.

Fives Lille-Cail: *See—*
Dambrine, Francis; and Gross, Gilles, 3,723,597.

Fizichesky Institut Imeni P.N. Lebedeva Akademii Nauk SSSR: *See—*
Kozlov, Stanislav Federovich, 3,723,726.

Flaherty, Francis E.; and Tupper, Wyman C., to Gillette Company, The. Processes for making cutting instruments. 3,723,195, Cl. 148-12.400.

Flank, William H.; McEvoy, James E.; and Stuart, John R.; deceased (by Stuart, Clara M.; successor), to Air Products and Chemicals, Inc. Catalyst for elevated temperatures. 3,723,351, Cl. 252-454.000.

Flannery, James E.; and Lemoine, Jacqg, to Corning Glass Works. Borosilicate opal glasses. 3,723,144, Cl. 106-54.000.

Fleetwood, Michael John: *See—*
Richards, Edward Gordon; Fontaine, Paul Isidore; and Fleetwood, Michael John, 3,723,107.

Fleetwood Systems, Inc.: *See—*
Mojden, Wallace W., 3,722,741.

Fleisher, Paul C., Jr.: *See—*
Rossell, Gary L.; Fleisher, Paul C., Jr.; and Seifer, Maurice I., 3,722,000.

Fleissner, Heinz, to Vepa AG. Process and apparatus for the production of synthetic leather. 3,723,161, Cl. 117-66.000.

Fleming, Jack Fairchild, to Sterling Plastics Co. Slide rule cursor. 3,722,796, Cl. 235-70.00b.

Fletcher, Albert B. Sprayer. 3,722,817, Cl. 239-77.000.

Flickinger, Daniel N. Amplifier system. 3,723,896, Cl. 330-30.00r.

Floren, Carl E.: *See—*

Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,723,043.

Florjancic, Peter. High force withstanding joint. 3,722,315, Cl. 74-520.000.

Flory, Brian Allen; and Geldard, Roger Michael, to Sharp and Company Limited. Angle sensor and a steering system based thereon. 3,723,011, Cl. 356-152.000.

Flowers, Thad T.; and Stuart, William I., to Springs Mills, Inc. Magnetically positioned guide means. 3,722,772, Cl. 226-196.000.

Floyd, Alfred E.: *See*—
Bauer, Charles A.; and Floyd, Alfred E., 3,722,938.

Fluidtech Corporation: *See*—
Osheroff, Gene W.; and Mc Gann, Laurence, 3,722,813.

FMC Corporation: *See*—
Fairbanks, Theodore H., 3,723,438.
Hampton, Quentin L., 3,722,698.
Start, John F.; and Towns, Donald L., 3,723,472.
Volpp, Gert Paul; and Dounchis, Harry, 3,723,448.
Wech, Robert J., 3,722,376.

FMN Schuster SA: *See*—
Herrmanns, Peter, 3,722,826.

Fogal, Gordon L.; and Kennedy, Thomas W., to United States of America, Navy. Delay arming device for submarine laid mines. 3,722,407, Cl. 102-16.000.

Follett, Archie E.: *See*—
Butler, John Mann; Follett, Archie E.; and Cass, Robert A., 3,723,202.

Fontaine, Paul Isidore: *See*—
Richards, Edward Gordon; Fontaine, Paul Isidore; and Fleetwood, Michael John, 3,723,107.

Ford Motor Company: *See*—
Bogart, Harold N.; Hopwood, Norman W., Jr.; Pearson, Archie A.; and Whitacre, Foster E., 3,722,257.
Chiang, James A., 3,722,458.
Nordstrom, John D., 3,723,167.

Foret, Claude H.: *See*—
Johnson, Wendell C.; Gomez, Nicolas G.; and Foret, Claude H., 3,722,083.

Forman, David L., to Sutra Import Corporation. Scoring counter. 3,722,461, Cl. 116-133.000.

Formo, Jerome L., to Plastics, Inc. Apparatus for injection molding articles from aminoplastic material. 3,723,037, Cl. 425-139.000.

Forney, George D., Jr., to Codex Corporation. Training adaptive linear filters. 3,723,911, Cl. 333-18.000.

Forsberg, Erik; and Landin, Uno, to Fredrikson, Gunnar, AB. Device for mounting wall parts. 3,722,165, Cl. 52-704.000.

Forshee, J. Harold, to Dow Badische Company. Strand heating device. 3,723,709, Cl. 219-388.000.

Forward, Robert L.: *See*—
Weber, Joseph; Zipoy, David M.; and Forward, Robert L., 3,722,284.

Forys, Joseph E.: *See*—
Hawkins, Harold V.; and Forys, Joseph E., 3,722,316.

Foster, Billy K., to General Dynamics Corporation. System for testing electronic apparatus. 3,723,868, Cl. 324-73.0at.

Foster Transformer Company: *See*—
Hoell, John, 3,722,082.

Foster, William Rees; and Skinner, Stanley John, to Monsanto Chemicals Limite.'. Process of extruding a foamable thermoplastic resin. 3,723,586, Cl. 264-53.000.

Fox, Charles F., Jr. Aerosol can construction. 3,722,750, Cl. 222-94.000.

Fox, John O.; and Rosling, Thomas H., to United States of America, Navy. Anti-swimmer charge. 3,722,408, Cl. 102-16.000.

Fox, Wayne L., to Electromask, Inc., mesne. Optical pattern generator or repeating projector or the like. 3,722,996, Cl. 355-53.000.

Foxboro Company, The: *See*—
Curran, John R., 3,722,860.

Fracassi, Pietro: *See*—
Daga, Giorgio Abbate; Cerrocchi, Lino; and Fracassi, Pietro, 3,723,285.

Francois, Maurice; and Denis, Marcel, to International Standard Electric Corporation. Adjustable stable power for continuous wave magnetron. 3,723,806, Cl. 315-39.510.

Francois, Paul L. Filter for removing particulate contaminants from fluids. 3,722,691, Cl. 210-304.000.

Frank, Edmund, to Packard Instrument Company, Inc. Method of and apparatus for sample vial transferring and changing. 3,722,719, Cl. 214-310.000.

Franke, Willard A., to Fuller, H. B., Company. Apparatus for forming hot melt adhesives into a readily packageable form. 3,723,035, Cl. 425-71.000.

Franz, Helmut, to PPG Industries, Inc. Stabilization of silvering solutions. 3,723,138, Cl. 106-1.000.

Fraser Sweatman, Inc.: *See*—
Connolly, Edward A., 3,722,533.

Fravel, Frank E., to Lee, Raymond, Organization, Inc., The. Fingernail clipper container. 3,722,518, Cl. 132-75.600.

Frazier, John F.; and Ziver, Caro M., to Corning Glass Works. Temperature sensor. 3,723,935, Cl. 338-28.000.

Frazier, William R., Jr., to General Dynamics Corporation. System for transmission, storage and/or multiplexing of information. 3,723,982, Cl. 340-174.10g.

Frederiksen, Thomas M.; and Long, Ernest L., to Motorola, Inc. Low current, low noise avalanche diode. 3,723,830, Cl. 317-234.00r.

Fredrikson, Gunnar, AB: *See*—
Forsberg, Erik; and Landin, Uno, 3,722,165.

Free Flow Packaging Corporation: *See*—
Fuss, Gunter G., 3,723,237.

Freese, Lennart Werner, to General Electric Company. Hydraulic axial piston machine of the bent-axis type. 3,722,372, Cl. 91-504.000.

Frehn, Fritz, to Deutsche Edelsthlwerke Geseelschaft mit beschrankter Haftung. Sintered alloys. 3,723,077, Cl. 29-182.700.

Frei, Gerhard; and Hintergraber, Maximillian, to Siemens Aktiengesellschaft. Pressure maintaining device and method for pressurized water reactors. 3,722,578, Cl. 165-1.000.

Frenken, Hans: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.

Freter, Kurt; and Zeile, Karl, to Boehringer, C. H., Sohn. Derivatives of 6,7-benzomorphan. 3,723,440, Cl. 260-293.540.

Freudenberger, John E., to Powers and Sons. Steering idler arm bracket. 3,722,907, Cl. 280-95.00a.

Freure, Robert J.; and Moyle, Maurice, to Gulf Oil Canada Limited. 2,4,'-Diamino dicyclohenz. 3,723,525, Cl. 260-563.00r.

Frey, Sydney W., Jr.; Gaa, Donald L.; and Tetamore, Robert W., to Bourns, Inc. Precision potentiometer with indicator. 3,723,937, Cl. 338-143.000.

Freye, James D.; and Poat, Jeffrey G., to Quaker Oats Company, The. Apparatus for producing cereal biscuits. 3,722,398, Cl. 99-237.00r.

Fricke, Heinz, to Gebr. Hofmann KG. Machinenfabrik. Two-column lifting platform. 3,722,627, Cl. 187-8.410.

Fridge, David S., Jr.: *See*—
Hill, Jack O.; Fridge, David S., Jr.; and Dibble, Vaughn R., Jr., 3,722,014.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Gritsch, Herbert; Meyerhoff, Herwig; Bruns, Enno; and Hemmie, Gerd, 3,723,959.
Kramer, Friedrich, 3,723,558.
Scheer, Kurt, 3,723,953.

Friedman, Raymond, to Factory Mutual Research Corporation. Fire protection system with time responsive discharge heads. 3,722,597, Cl. 169-38.000.

Friedsam, Josef: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.

Frohberger, Paul-Ernst: *See*—
Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,723,628.

Froning, H. R.; Raza, Syed H.; and Askew, Warren S., to Amoco Production Company. Method of mobility control in miscible displacement process. 3,722,590, Cl. 166-273.000.

Frosst, Charles E., & Co.: *See*—
Wasson, Burton Kendall, 3,723,443.

Frost, Richard H.; Maguire, John; and Sharp, Jonathan E., to Rose Manufacturing Company. Mold for the manufacture of a plastic rope connector. 3,723,036, Cl. 425-129.000.

Fruehan, Richard J.; and Turkdogan, Ethem T., to United States Steel Corporation. Apparatus for oxygen determination. 3,723,279, Cl. 204-195.00s.

Fruehauf Corporation: *See*—
Prokop, Bohdar, 3,722,157.
Tantlinger, Keith W., 3,722,716.

Fuchs, Franz, to SKF Kugellagerfabriken Gesellschaft mit beschrankter Haftung. Apparatus for mounting top rollers. 3,722,036, Cl. 19-282.000.

Fuchs, Otto. Process for the manufacture of PVF shaped articles. 3,723,171, Cl. 117-122.0pf.

Fuchs, Werner: *See*—
Nagel, Otto; Platz, Rolf; and Fuchs, Werner, 3,723,545.

Fuchsman, Charles H., to Ferro Corporation. Benzoxazinediones. 3,723,426, Cl. 260-244.00r.

Fudemoto, Isao: *See*—
Kawashima, Masao; Ohtsuki, Mikio; Fudemoto, Isao; and Tomimori, Kiyoshi, 3,723,875.

Fuji Photo Film Co., Ltd.: *See*—
Hayashi, Jun; Ohi, Reiichi; Shishido, Tadao; and Kondo, Tokiharu, 3,723,125.
Iwano, Haruhiko; Tanaka, Mitsugu; Otsuki, Tetsuo; and Arai, Atsuaki, 3,723,118.
Miyatsuka, Hajime, 3,723,115.
Tatsuta, Sumitaka; and Ueno, Wataru, 3,723,159.
Yano, Akira; and Kimura, Tsutomu, 3,723,122.
Yoshida, Toshiichi; Nakamura, Takashi; and Ohkubo, Kinji, 3,723,119.

Fujii, Minoru, to Nippondenso Co., Ltd. Magneto-dynamo-operated ignition device for multi-cylinder engines. 3,723,809, Cl. 315-211.000.

Fujii, Seiji; Uwamoto, Hiroshi; Ishida, Masayuki; and Kamata, masamoto, to Nippon Kokan Kabushiki Kaisha. Method of controlling continuous rolling of metal strips. 3,722,244, Cl. 72-16.000.

Fujimoto Company Ltd., The: *See*—
Yazaki, Seiichi, 3,722,728.

Fujino, Hidekazu: *See*—
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Fujio, Takashi; and Komoto, Taro, to Nippon Hoso Kzokai. Color television system including additional information signals in pulse code on a special color burst. 3,723,637, Cl. 178-5.20r.

Fujita, Mitsuo, to Victor Company of Japan, Limited. Color video signal recording and reproducing system. 3,723,638, Cl. 178-5.4cd.
Fujita, Tatsu: *See—*
Yamamoto, Shunji; Fujita, Tatsu; Yamaguchi, Yoshihiro; and Noguchi, Masataka, 3,722,245.
Fujitsu Limited: *See—*
Kawashima, Masao; Ohtsuki, Mikio; Fudemoto, Isao; and Tomimori, Kiyoshi, 3,723,875.
Fukuda, Kenji; and Honkawa, Tadashi, to Hitachi, Ltd. Differential spectrophotometer. 3,723,008, Cl. 356-88.000.
Fukuda, Makoto: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,723,754.
Fukushima, Rinjiro. Liquid coupling. 3,722,926, Cl. 285-261.000.
Fukuura, Yukio: *See—*
Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, 3,723,239.
Fulghum, David A.: *See—*
Zurek, James W.; and Fulghum, David A., 3,722,642.
Fuller, H. B., Company: *See—*
Franke, Willard A., 3,723,035.
Furia, Thomas E.; and Steinberg, David H., to Ciba-Geigy Corporation. Metal complexes of mercapto quinoline N-oxides. 3,723,435, Cl. 260-270.00r.
Furlani, Romeo, to International Telephone and Telegraph Corporation. Modulating ball valve. 3,722,545, Cl. 137-625.300.
Furnas Electric Company: *See—*
Sitar, Clement P., 3,723,929.
Furuta, Koichi, to Nippon Kogaku K.K. Frame counter for cameras. 3,722,386, Cl. 95-31.0ds.
Fuss, Gunter G., to Free Flow Packaging Corporation. Packing material and method. 3,723,237, Cl. 161-168.000.
Fussell, Theodore J.: *See—*
Rodely, Alan E.; and Fussell, Theodore J., 3,722,275.
Gaa, Donald L.: *See—*
Frey, Sydney W., Jr.; Gaa, Donald L.; and Tetamore, Robert W., 3,723,937.
Gabor, Andrew, to Diablo Systems, Inc. Temperature compensation system for a magnetic disk memory unit. 3,723,980, Cl. 340-174.10b.
Gach, Peter P., to Sunbeam Plastics Corporation. Safety closure for a medicine bottle. 3,722,727, Cl. 215-9.000.
Gacs, Peter T.; and Williams, Lucien C., to General Steel Industries, Inc. Over-the-wing aircraft loading bridge. 3,722,017, Cl. 14-71.000.
GAF Corporation: *See—*
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,723,578.
Field, Nathan D.; and Williams, Earl P., 3,723,375.
Gaffney, Bernard J., to Conwed Corporation. Method for the manufacture of net and net like products. 3,723,218, Cl. 156-167.000.
Gagnon, Rudolph A., to Lee, Raymond, Organization, Inc. Disposable safety rotary razor. 3,722,091, Cl. 30-40.000.
Gail, Josef. Hitch for coupling agricultural implements to a towing vehicle. 3,722,915, Cl. 280-415.00a.
Gaiser, Floyd E. Machine. 3,722,060, Cl. 29-203.00d.
Gallucci, Francis, to United States Steel Corporation. Method and apparatus for straightening continuous casting. 3,722,576, Cl. 164-282.000.
Gambrell, James B.: *See—*
Hovick, Jack H., 3,722,503.
Garabedian, Joseph; and Garabedian, Mike. Unstacking machine for trays and the like. 3,722,713, Cl. 214-8.50a.
Garabedian, Mike: *See—*
Garabedian, Joseph; and Garabedian, Mike, 3,722,713.
Garcia, Juan A., to Esso Production Research Company. System and method for cleaning oily solid material. 3,723,309, Cl. 210-44.000.
Garcy Corporation: *See—*
Marker, Edwin M., Jr., 3,722,702.
Gardella, Adriano M. Can spinning frame. 3,722,199, Cl. 57-77.000.
Gardner, Stewart F. Back and end walls for bathtub alcove. 3,722,151, Cl. 52-36.000.
Garmonov, Izmail Vladimirovich: *See—*
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra, 3,723,400.
Gates Rubber Company, The: *See—*
Kesinger, Donald A.; and Inscho, Leland S., Jr., 3,722,137.
Stark, Robert E.; and Walker, Douglas W., 3,723,184.
Gatsis, John G.; and Gleim, William K. T., to Universal Oil Products Company. Conversion of asphaltene-containing hydrocarbonaceous charge stocks. 3,723,294, Cl. 208-86.000.
Gatsis, John G.; and Gleim, William K. T., to Universal Oil Products Company. Conversion of asphaltene-containing charge stocks. 3,723,297, Cl. 208-95.000.
Gauchat, Richard H.; and Sabel, Nathan W., to United States of America, Navy. Quick-disconnect electrical connector. 3,723,944, Cl. 339-45.00r.
Gaven, Joseph V., Jr.: *See—*
Stephenson, John L.; and Gaven, Joseph V., Jr., 3,723,130.
Gavlefors, Sture: *See—*
Lee, Lars; Gavlefors, Sture; and Eriksson, Olle, 3,723,247.
Gaylord, John A.: *See—*
Kopfer, Rudolph F.; and Gaylord, John A., 3,722,096.
Gaylord, John A. Device for clearing impurities from the atmosphere. 3,722,183, Cl. 55-128.000.
G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli: *See—*
Seragnoli, Ariosto, 3,722,172.
Gebr. Hofmann KG. Machinenfabrik: *See—*
Fricke, Heinz, 3,722,627.
Geene, Robert W.: *See—*
Thrailkill, Arthur E.; and Geene, Robert W., 3,722,421.
Gehl Company: *See—*
Braunberger, Benjamin A., 3,722,191.
Geldard, Roger Michael: *See—*
Flory, Brian Allen; and Geldard, Roger Michael, 3,723,011.
Gelfand, Daniel, to Buchler Instruments Division, Nuclear-Chicago Corporation. Peristaltic pump with stacked components. 3,723,030, Cl. 417-475.000.
Gelsenberg Benzin Aktiengesellschaft: *See—*
Muller, Helmut; and Peterlein, Karl, 3,723,516.
Gemein, Rudolf; and Holzer, Gerold, to Kraftwerk Union Aktiengesellschaft. Radial slide bearings constructed as three-wedge bearings, preferably for turbomachines. 3,722,965, Cl. 308-122.000.
General American Transportation Corporation: *See—*
Konrad, Parker, 3,723,078.
General Dynamic Corporation: *See—*
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,928.
General Dynamics Corporation: *See—*
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,722,360.
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,927.
Clay, John P.; and Lintvedt, Vernon L., 3,723,231.
Foster, Billy K., 3,723,868.
Frazier, William R., Jr., 3,723,982.
General Electric Company: *See—*
Arnold, Richard B., 3,722,063.
Bahr, Donald W.; and Harshman, Daniel L., 3,722,216.
Bobear, William J., 3,723,481.
Buckland, Bruce O., 3,722,624.
Charewicz, Francis J., 3,723,819.
Corsmeier, Robert J., 3,722,058.
Davidson, William E., 3,722,117.
Freese, Lennart Werner, 3,722,372.
Hall, Walter L.; and Webb, Jimmy L., 3,723,465.
Hoback, John T.; and Holub, Fred F., 3,723,385.
Koch, Robert E., 3,723,930.
Leonard, Stephen C., 3,723,859.
Lit, Harry B.; and Mazzetti, Mark S., 3,723,823.
Miller, Homer R.; and Vallone, Giacinto, 3,723,932.
Mundy, Joseph L., 3,723,979.
Peil, William, 3,723,895.
Pollard, Ernest M., 3,723,816.
Rich, Harold, 3,723,872.
Smith, Gene K.; and Tye, Gene, 3,723,005.
Sulcs, Jurist; and McKimm, Robert W., 3,723,784.
Tassie, Douglas P.; and Clark, Burton P., 3,722,356.
Wirth, Joseph G., 3,723,449.
General Engineering Company: *See—*
Sedwell, Alfred James, 3,722,899.
General Fireproofing Company: *See—*
Textoris, Melvin A., 3,722,973.
General Foods Corporation: *See—*
Hodge, William V.; and Lee, Charleston R., 3,723,132.
General Metalcraft, Inc.: *See—*
Marantette, Louis E., 3,722,252.
General Mills Chemicals, Inc.: *See—*
Nordgren, Robert; Jones, Duane A.; and Wittcoff, Harold A., 3,723,408.
General Mills, Inc.: *See—*
Chivers, Thomas E., 3,723,134.
Yueh, Mao H., 3,723,409.
General Motors Corporation: *See—*
McCall, Donald F., 3,723,696.
Walker, Frank H.; and Craig, Richard W., 3,722,321.
General Steel Industries, Inc.: *See—*
Gacs, Peter T.; and Williams, Lucien C., 3,722,017.
Geneva Industries, Inc.: *See—*
Stoeckl, Ernest P., 3,722,937.
George, Edward T.: *See—*
Allen, Irving; George, Edward T.; and Nordquist, Albert W., 3,722,351.
Georges, Michael P. Examination paper test score system. 3,722,111, Cl. 35-48.00b.
Gerasimov, Ivan Konstantinovich: *See—*
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, 3,723,267.
Gerke, Peter; Bock, Helmuth-Joachim; and Sennefelder, Anton, to Siemens Aktiengesellschaft. Switching circuit arrangement for cross-wire control apparatus for communication system. 3,723,660, Cl. 179-18.0ge.
Gerritse, Alf: *See—*
Peill, Jurgen Eberhardt; Gerritse, Alf; Osmera, Miroslav S.; and Andersen, Christian Karmark, 3,722,396.
Geus, John W.: *See—*

Eurlings, Jacobus J. M. G.; Geus, John W.; and Weterings, Cornelis A. M., 3,723,353.

Gezari, Walter A., to Internation Telephone and Telegraph Corporation, mesne. Blind cavity holding sump. 3,722,538, Cl. 137-588.000.

Gharaibeh, Hashem M., to Warwick Electronics Inc. Component insertion system. 3,722,062, Cl. 29-203.00b.

Gibier-Rambaud, Alain; and Blanc, Bernard. Process for the preparation of polyurethane prepolymers comprising terminal isocyanate groups. 3,723,394, Cl. 260-77.5aa.

Gibson, Roger E.: *See—*
Wood, Edwin L.; and Gibson, Roger E., 3,723,147.

Gifford, Howard W.: *See—*
Whipple, William D.; and Gifford, Howard W., 3,722,126.

Gifford, Joseph H.: *See—*
Merrill, Charles E.; and Gifford, Joseph H., 3,722,134.

Giguere, Irving J.: *See—*
Peterson, Thomas G.; and Giguere, Irving J., 3,723,852.

Giguere, Irving J., to Superior Electric Company, The. Interface circuit. 3,723,759, Cl. 307-203.000.

Gilbert, Harold James, to Wickman Machine Tool Sales Limited. Multi-spindle automatic lathes. 3,722,333, Cl. 82-29.000.

Gilbertson, John E. Air purifying and deodorizing device for automobiles. 3,722,182, Cl. 55-124.000.

Gilinson, Philip J., Jr.; and Dauwalter, Charles R., to Massachusetts Institute of Technology. Oscillating viscometer. 3,722,262, Cl. 73-59.000.

Gill, John H.: *See—*
Gill, Joseph G.; Gill, John H.; and Holmes, Arthur J., 3,722,718.

Gill, Joseph G.; Gill, John H.; and Holmes, Arthur J. Hydraulic control system for a skip hoist. 3,722,718, Cl. 214-100.000.

Gillette Company, The: *See—*
Flaherty, Francis E.; and Tupper, Wyman C., 3,723,195.

Gillum, Donald E., to Information Magnetics Corporation. Compensated linear motor. 3,723,779, Cl. 310-13.000.

Gillum, Donald E., to Information Magnetics Corporation. Self shielding linear motor. 3,723,780, Cl. 310-13.000.

Gilman, Samuel, to Terminal Data Corporation. Hub-core assembly. 3,722,929, Cl. 287-53.0ss.

Gindy Manufacturing Corporation: *See—*
Bende, Albert J.; and Defalco, Ralph L., 3,722,054.

Girault, Pierre: *See—*
Allais, Andre; and Girault, Pierre, 3,723,091.

Girsky, Charles: *See—*
Nathanson, Albert; Girsky, Charles; and Miller, Matthew R., 3,722,124.

Gits Bros., Mfg., Co., Inc.: *See—*
Jackson, Richard H.; and Bak, Harry B., 3,722,102.

Glanzstoff AG: *See—*
Rupp, Hans-Dieter; and Magerlein, Helmut, 3,723,604.

Gledhill, Eric Guy Brian, to Talbot, F. W., & Company, Limited. Apparatus for and method of controlling flow of fluids in a pipeline. 3,722,520, Cl. 137-1.000.

Gledhill Road Machinery Company: *See—*
Gledhill, William, 3,722,025.

Gledhill, William, to Gledhill Road Machinery Company. Leaf collector. 3,722,025, Cl. 15-340.000.

Gleim, William K. T.: *See—*
Gatsis, John G.; and Gleim, William K. T., 3,723,294.
Gatsis, John G.; and Gleim, William K. T., 3,723,297.

Gleim, William K. T.; and Ramquist, Frederick C., to Universal Oil Products Company. Hydrogenation catalyst and process. 3,723,560, Cl. 260-677.00h.

Glessner, Alfred J.; and Wentzheimer, William Wayne, to Sun Oil Company of Pennsylvania. Removal of straight chain hydrocarbons from different hydrocarbon stocks. 3,723,292, Cl. 208-85.000.

Glessner, Alfred J.; Wentzheimer, William Wayne; and Kress, Rene F., to Sun Oil Company of Pennsylvania. Process for producing gasoline blending stock of high antiknock value. 3,723,293, Cl. 208-85.000.

Global Marine Inc.: *See—*
Crooke, Robert Curtis; and Hilsabeck, Carl E., 3,722,268.

Globe-Union Inc.: *See—*
Hennen, Roy Erving, 3,723,188.

Glock, Loran P.: *See—*
Glock, Milton J.; and Glock, Loran P., 3,722,155.

Glock, Milton J.: *See—*
Glock, Milton J.; and Glock, Loran P. (said Glock, Loran P., assor. to said), 3,722,155.

Glock, Milton J.; and Glock, Loran P., said Glock, Loran P., assor. to said Glock, Milton J. Cemetery covered by an artificial turf material. 3,722,155, Cl. 52-133.000.

Godfrey, Harold E., Jr.: *See—*
Brackenbrough, Dennis D.; Godfrey, Harold E., Jr.; and Mills, Richard G., 3,723,743.

Godfrey, Wesley L., to United States of America, Atomic Energy Commission. Method of reducing the release of mobile contaminants from granular solids. 3,723,338, Cl. 252-301.10w.

Godley, Fred Darroll, to Modular Wall Systems, Inc. Building roof structure and method. 3,722,171, Cl. 52-745.000.

Goering, Lowell J.: *See—*
Fell, Ferol S.; Goering, Lowell J.; and Long, William D., 3,722,277.

Goetze, Walter; Wolf, Peter; Schulz, Gerhard; and Luedemann, Horst, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of mixtures of monoethanolamine and triethanolamine. 3,723,530, Cl. 260-584.00r.

Goffe, William L., to Xerox Corporation. Electrophotographic process. 3,723,110, Cl. 96-1.0pc.

Goffe, William L., to Xerox Corporation. Polychromatic electrosolographic imaging process. 3,723,113, Cl. 96-1.200.

Golding, Leonard S.: *See—*
Kaul, Pradman P.; and Golding, Leonard S., 3,723,879.

Goldman, Jerome L., to Lash Systems, Inc. Stabilizing device for lighters on hatch covers of cargo vessels. 3,722,736, Cl. 220-97.00b.

Goldman, Jerome Lee, to Lash Systems, Inc. Lighter-ship stabilizing system. 3,722,449, Cl. 114-75.

Goldschmidt, Th., A.G.: *See—*
Rossmy, Gerd; and Koerner, Gotz, 3,723,491.

Gomez, Nicolas G.: *See—*
Johnson, Wendell C.; Gomez, Nicolas G.; and Foret, Claude H., 3,722,083.

Goodrich, B. F., Company, The: *See—*
Wu, Ching Yong; and Swift, Harold E., 3,723,553.

Goodyear Aerospace Corporation: *See—*
Hogan, James J.; and Iler, Theodore W., 3,723,717.

Gordini, Amedee, to S.A. Gordini Automobiles. Devices for controlling the valves of internal combustion. 3,722,484, Cl. 123-90.270.

Gordon, Frank J.; and Damm, Charles C., to United States of America, Atomic Energy Commission. Multiple ion source array. 3,723,730, Cl. 250-41.90c.

Gordon, Richard O., to Harnischfeger Corporation. Hoist-testing apparatus and control system therefor. 3,722,267, Cl. 73-133.00r.

Gorog, Istvan, to RCA Corporation. Optically-scanned liquid-crystal projection display. 3,723,651, Cl. 178-7.50d.

Goto, Eizo, to Tokyo Shibaura Electric Co., Ltd. Spark chamber apparatus for detecting radiations. 3,723,788, Cl. 313-93.000.

Goto, Jogo: *See—*
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo, 3,723,372.

Goto, Kunihiro: *See—*
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, 3,723,093.

Gotzfried, Konrad. Method and apparatus for spinning yarns of staple fibers and filaments. 3,722,198, Cl. 57-58.890.

Gould, Charles D. Marine crane, particularly designed for handling cargo containers. 3,722,705, Cl. 212-15.000.

Gould, Wallace E.: *See—*
Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,723,043.

Goya, Tamotsu; and Sill, James E., to Cenco Medical/Health Supply Corporation. Surgical gown and method of folding. 3,721,999, Cl. 2-114.000.

Grace, Rex C.: *See—*
Zeunen, Barthel; Grace, Rex C.; and Dunn, Alire R., 3,723,001.

Grace, W. R., & Co.: *See—*
Rivman, Samuel Joseph, 3,722,785.

Gracheva, Maia Arkadievna: *See—*
Mikheev, Nikolai Borisovich; Gracheva, Maia Arkadievna; Bogomolova, Ljubov Grigorievna; and Levin, Valentin Ilich, 3,723,612.

Gradnik, Boris; Pedrazzoli, Andrea; and Dall'Asta, Leone, to Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicales E.R.A. S.M.E. 1-(Beta-sulphonyloxy-ethyl)-imidazoles. 3,723,453, Cl. 260-309.000.

Grahl, Darwin R., to Parker-Hannifin Corporation. Coupling joint for plastic covered metal tube. 3,722,923, Cl. 285-55.000.

Grahn, Arne Y., to Poly-Choke Company, Incorporated, The. Universal tool sharpening fixture. 3,722,148, Cl. 51-225.000.

Gramera, Robert E.: *See—*
Hicks, James P.; Gramera, Robert E.; and Molotsky, Hyman M., 3,723,412.

Gramm, Eugene R., to Bourns, Inc. Non-linear potentiometer with conductor array. 3,723,938, Cl. 338-162.000.

Granberg, Mauritz; and Mueller, Hubert W., Jr., to Sperry Rand Corporation. Digital vector generator utilizing intensity control as a function of vector angle and velocity. 3,723,802, Cl. 315-18.000.

Grand City Container Corporation: *See—*
Rous, Arthur, 3,722,783.

Granlund, Gosta Holger, to Saab-Scania Aktiebolag. Control unit for monitoring electronic control systems for braking devices in wheeled vehicles. 3,723,965, Cl. 340-53.000.

Gratz, Ronald L., to Continental Oil Company. Submersible single point mooring facility. 3,722,223, Cl. 61-46.000.

Gray, Jack K. Leaf and refuse catcher. 3,722,023, Cl. 15-257.100.

Greason, William Wallace, III: *See—*
Dellecker, Raymond Whyte; Greason, William Wallace, III; Hayden, Paul Ross; and Weiner, David William, 3,723,661.

Greatbatch, Wilson, to Greatbatch, Wilson, Ltd. Lithium battery enclosure. 3,723,183, Cl. 136-83.00r.

Greatbatch, Wilson, Ltd.: *See—*
Greatbatch, Wilson, 3,723,183.

Greaves, Jeffrey Chester; and Oakes, William George, to Imperial Chemical Industries, Limited. Olefine polymerisation at high pressures using a dispersed ziegler-type catalyst. 3,723,403, Cl. 260-94.900.

Greaves, Melvin J., to McKee, Arthur G., & Company. Blast furnace with staggered tuyere system. 3,722,871, Cl. 266-29.000.

Greenberg, Charles B.; and Crissman, Roy G., to PPG Industries, Inc. Wet chemical method of producing transparent metal films. 3,723,155, Cl. 117-35.00s.

Greenwood, Roger, to International Telephone and Telegraph Corporation. Pressure responsive switch with parallel contact blades bent apart by axial force applied by diaphragm. 3,723,684, Cl. 200-83.00r.

Gref, Hans: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.

Gregerson, David A.; and Selm, Gerald J., to Philco-Ford Corporation. Sight glass. 3,722,537, Cl. 137-559.000.

Gregoire, Harvey G., to United States of America, Navy. Adjustable anthropometer. 3,722,103, Cl. 33-174.00d.

Gretag Aktiengesellschaft: *See—*
Schnellmann, Oskar, 3,722,768.

Grewe, Ferdinand: *See—*
Buchel, Karl Heinz; Grewe, Ferdinand; and Kospers, Helmut, 3,723,622.
Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,723,628.

Gribalev, Nilolai Ivanovich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

Griffin, John F. Method and furnace for sintering. 3,722,870, Cl. 266-20.000.

Grigorenko, Georgy Mikhailovich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Grigoriev, Viktor Ivanovich: *See—*
Lifshits, Viktor Senderovich; Grigoriev, Viktor Ivanovich; Petrov, Georgy Nikolaevich; and Papkov, Oleg Sergeevich, 3,723,701.

Grimm, Duane H.: *See—*
Cordner, Michael A.; and Grimm, Duane H., 3,722,324.

Griswold Controls: *See—*
Griswold, David E.; and McCarty, William E., 3,723,827.

Griswold, David E.; and McCarty, William E., to Griswold Controls. Selective and sequential control system. 3,723,827, Cl. 317-137.000.

Gritsch, Herbert; Meyerhoff, Herwig; Bruns, Enno; and Hemmie, Gerd, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Apparatus for indicating acoustical or electromagnetic signals. 3,723,959, Cl. 340-6.00r.

Grochowski, Edward G.: *See—*
Castrucci, Paul P.; Grochowski, Edward G.; Hess, Martin S.; and Zachos, Elias B., 3,723,200.

Gross, Gilles: *See—*
Dambrine, Francis; and Gross, Gilles, 3,723,597.

Gross, Thomas A. O. Phase-sensitive ground fault protective systems. 3,723,814, Cl. 317-18.00d.

Grounds, Robert B.: *See—*
Johnson, Dale W.; Grounds, Robert B.; and Langford, Donald C., 3,723,851.

Grove Valve and Regulator Company: *See—*
Parola, Gary D., 3,722,854.

Grupp Leptit S.p.A.: *See—*
Pifferi, Giorgio, 3,723,502.

GTE Automatic Electric Laboratories Incorporated: *See—*
MacRander, Mas S., 3,723,662.
Sheahan, Desmond F.; and Callander, George C., 3,723,920.

GTE Sylvania Incorporated: *See—*
Alexander, Robert H.; and Ballard, Paul E., 3,722,046.
Benenati, Robert L., 3,723,894.
Buescher, William E., 3,722,045.

Guardian Industries Corporation: *See—*
McMaster, Harold A., 3,723,085.

Guardigli S.p.A.: *See—*
Daga, Giorgio Abbate; Cerrocchi, Lino; and Fracassi, Pietro, 3,723,285.

Guastella, Samuel L.; and Larrivee, Jerry J., Jr., to Blandin Paper Company. Process of coating paper. 3,723,169, Cl. 117-111.00h.

Gude, Fritz: *See—*
Schmitt, Karl; and Gude, Fritz, 3,723,350.

Guillot, Jack. Gearbox for controlling the mechanisms of a gas turbine engine having rotary heat exchangers. 3,722,214, Cl. 60-39.310.

Gulf & Western Industrial Products Company: *See—*
Martin, Elwood Allen, 3,722,255.

Gulf Oil Canada Limited: *See—*
Freure, Robert J.; and Moyle, Maurice, 3,723,525.

Gulf Oil Corporation: *See—*
Stenstrom, Borje, 3,722,690.

Gulf Research & Development Company: *See—*
Doyle, William Carter, Jr., 3,723,493.
Larson, John G.; and Orange, John M., 3,723,732.

Gunnell, Geoffrey Herbert Arthur; and Shaw, Frank Derek, to English Electric Company, Limited, The. Tire and brake test device. 3,722,269, Cl. 73-146.000.

Gunter, Gehrke; Hederich, Volker; Harms, Wolfgang; and Wagner, Peter, to Bayer Aktiengesellschaft. Antraquinone dyestuffs. 3,723,480, Cl. 260-373.000.

Gupta, Suresh K.: *See—*
Zeldman, Maurice I.; Walker, Edward J.; and Gupta, Suresh K., 3,723,737.

Gurney, John A.: *See—*
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,723,547.

Gushi, Peter James; and Kyts, Robert B. Modular vending machine having trap-door ejection mechanism. 3,722,745, Cl. 221-130.000.

Gutnajer, Ludwik, to Budd Company, The. EDM Electrode. 3,723,695, Cl. 219-69.00r.

Guyot, Joel, to Thomson-CSF. Devices for carrying out spectral analysis. 3,723,869, Cl. 324-77.00b.

Haake, Robert, to Bell & Howell Company. Tape recorder with cassette changer. 3,722,892, Cl. 274-4.00f.

Habicht, Ernst: *See—*
Zergenyi, Janos; and Habicht, Ernst, 3,723,619.

Hackman, Frank C.: *See—*
Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,723,043.

Hagenbach, Robert J.; and Madrid, Robert W., to Xerox Corporation. Thermosetting electrostatographic developer of a carrier and prepolymer of diallyl phthalate, isophthalate and mixtures. 3,723,114, Cl. 96-1.400.

Hagener, James L.: *See—*
Church, Herman S.; and Hagener, James L., 3,722,939.

Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., to Moog Inc. Automatic tool changer. 3,722,363, Cl. 90-11.00d.

Hahn, Frederick K., to Texaco Inc. Hydroconversion of petroleum oils. 3,723,296, Cl. 208-89.000.

Hahn, Inc.: *See—*
Sorenson, Charles E.; and Stubblefield, Clyde D., 3,722,314.

Hahnkamm, Volker; Broja, German; Brandle, Karl; and Elstermann, Calus-Heinrich, to Bayer Aktiengesellschaft. Process of chromium (III) of low sulfur content. 3,723,611, Cl. 423-607.000.

Hain, Edward: *See—*
Better, Bernard R.; and Hain, Edward, 3,722,312.

Haldas, Walter J.; and Faust, Jesse A., to Lone Star Cement Corporation. Well cementing composition and method. 3,723,145, Cl. 106-90.000.

Haley, John S.; and Cooper, Jerry W., to Dayco Corporation. Endless track. 3,722,961, Cl. 305-25.000.

Halfon, Albert: *See—*
Moen, Walter B.; and Halfon, Albert, 3,722,179.

Hall, Alvin R., to Hordis Bros., Inc. Combined window and louver construction. 3,722,572, Cl. 160-107.000.

Hall, James M.; and Clipp, Louis L., to Exotech Incorporated. Pulsed jet riot control apparatus. 3,722,819, Cl. 239-102.000.

Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., to Ciba-Geigy Corporation. Polysubstituted dihydropyrenes. 3,723,547, Cl. 260-645.000.

Hall, Walter L.; and Webb, Jimmy L., to General Electric Company. Dibenzopyrans, their isomeric fluorenols and dibenzothiopyrans. 3,723,465, Cl. 260-328.000.

Halls, Lawrence M., to Sperry Rand Corporation. Converging reel assembly having a tine control mechanism incorporated therein. 3,722,194, Cl. 56-226.000.

Halocarbon Products Corporation: *See—*
Conner, Rex C.; and Ferstandig, Louis L., 3,722,211.

Ham, Allan L.: *See—*
Augstein, Joachim; Ham, Allan L.; Leeming, Peter R.; and Snarey, Michael, 3,723,524.

Ham, Donald L.: *See—*
Talmo, Robert Eugene; Ham, Donald L.; and Leyrer, Lowell J., 3,722,264.

Hamada, Arinobu; Ohnishi, Yuuji; and Sekiguchi, Tunehisa, to Showa Denko K.K. Method for increasing wear resistance of a rubbing surface of aluminum alloy articles. 3,723,209, Cl. 156-6.000.

Hamamoto, Masao: *See—*
Takeyama, Kojiro; and Hamamoto, Masao, 3,722,106.

Hamblyn, Stephen Mark; Money, Anthony Patrick; and MacKinnon, Ian Malcolm, to United States Borax & Chemical Corporation. High temperature chemical reaction apparatus. 3,723,290, Cl. 204-328.000.

Hamermesh, Charles L.; and Hirshfield, Stanley M., to North American Rockwell Corporation. Polymerization method polymerization of glycioyl 2,2-dinitro-2-fluoroethoxide with a prepolymerdiol. 3,723,539, Cl. 260-615.0bf.

Hammann, Ingeborg: *See—*
Fest, Christa; and Hammann, Ingeborg, 3,723,456.

Hammer, Frank E., to Searle, G. D., & Co. Lyophilized aryl phosphate monoesters and process therefor. 3,723,579, Cl. 260-954.000.

Hammersmith, James R.: *See—*
Reynolds, Martin Lance; Hammersmith, James R.; and Parish, Harlie A., Jr., 3,722,515.

Hammill, William R., to CCI Aerospace Corporation. Convergent-divergent ejector exhaust nozzle. 3,722,797, Cl. 239-264.170.

Hammond, Jack B.: *See—*
Chandler, Ronald W.; and Hammond, Jack B., 3,722,276.

Hamon, Bernard; and Montel, Jean-Pierre, to Lignes Telegraphiques et Telephoniques. Noise figure meter. 3,723,874, Cl. 324-158.00t.

Hampton, Quentin L., to FMC Corporation. Circular clarifier mechanism. 3,722,698, Cl. 210-525.000.

Hanchett, George Draper: *See—*
Sterner, John Franklin; and Hanchett, George Draper, 3,723,905.

Handl, Ernesto G. Element for rapid joint for tubular fishing lines. 3,722,130, Cl. 43-44.980.

Hanks, Fletcher. Method for removing meat from the shells of bivale mollusks. 3,722,035, Cl. 17-48.000.

Hans, Joachim; Ditschler, Hans Jorgen; and Russeler, Gerhard. Gear shaping apparatus. 3,722,359, Cl. 90-7.000.

Hansen, Ib Schreiner. Drive mechanism for automatically varying the vertical and horizontal throwing angles of a target trap. 3,722,495, Cl. 124-9.000.

Hansen, Kenneth R., to Colgate-Palmolive Company. Liquid detergent composition. 3,723,357, Cl. 252-545.000.

Hansen, Kent W.: *See—*
Davis, Earl K.; and Hansen, Kent W., 3,723,835.

Hanson, Richard M., to McGraw-Edison Company. Garment press. 3,722,115, Cl. 38-21.000.

Hantman, Edwin F.: *See—*
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.

Hara, Michio: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.

Haramura, Shigenori: *See—*
Maekawa, Tadashi; Suzuki, Akira; and Haramura, Shigenori, 3,722,369.

Hardiss, Donald E.: *See—*
Bissinger, William E.; Hardiss, Donald E.; and Lavanish, Jerome M., 3,723,538.

Harkins, Mary B. Drapery hook pin applicator. 3,722,067, Cl. 29-278.000.

Harmischfeger Corporation: *See—*
Hedeen, Nils E.; and Javenkoski, Carl W., 3,722,707.

Harms, Wolfgang: *See—*
Gunter, Gehrke; Hederich, Volker; Harms, Wolfgang; and Wagner, Peter, 3,723,480.

Harnick, Robert, to Blair Manufacturing Co. Chair with replaceable upholstery cover. 3,722,950, Cl. 297-218.000.

Harnisch, Heinz: *See—*
Meurer, Peter Lorenz; Dorn, Friedrich Wilhelm; and Harnisch, Heinz, 3,723,608.
Preisler, Eberhard; Harnisch, Heinz; and Mietens, Gerhard, 3,723,265.

Harnischfeger Corporation: *See—*
Gordon, Richard O., 3,722,267.

Harnoncourt, Karl; and Zeiringer, Rudolf, to List, Hans. Electrode arrangement for the measurement of partial pressures of gases. 3,723,280, Cl. 204-195.00p.

Harper, Paul W. Container closure. 3,722,784, Cl. 229-43.000.

Harrington, Joseph Kenneth: *See—*
Robertson, Jerry E.; Harrington, Joseph Kenneth; and Banitt, Elden H., 3,722,599.

Harris, Earl D., to Warner & Swasey Company, The. Detector assembly. 3,722,880, Cl. 271-51.000.

Harris, Jack R., to United States of America, Navy. Automatic targeting system. 3,723,960, Cl. 340-6.00r.

Harris, John L., to Deltrol Corporated. Dual adjustment cycling timer. 3,722,294, Cl. 74-3.520.

Harris, John L., to Deltrol Corporation. Latch-trip cam operated percentage timer. 3,723,676, Cl. 200-39.00r.

Harris, Joseph Warren, to Industries, C. R. Apparatus for positioning metering devices. 3,722,065, Cl. 29-237.000.

Harris, Martin: *See—*
Swimmer, James A.; and Harris, Martin, 3,722,838.

Harrison, Lee, III; Wells, Frank David; and Honey, Francis J., to Computer Image Corporation. Generation, display and animation of two-dimensional figures. 3,723,803, Cl. 315-22.000.

Harshman, Daniel L.: *See—*
Bahr, Donald W.; and Harshman, Daniel L., 3,722,216.

Hart Chemical Limited: *See—*
Shane, Hugh J. S.; Schill, John E.; and Lilley, John W., 3,723,342.

Hart, H. W., Mfg., Co.: *See—*
Hart, Harold W.; and Southworth, Edward A., 3,722,664.

Hart, Harold W.; and Southworth, Edward A., to Hart, H. W., Mfg., Co. Articulated pusher conveyor chain. 3,722,664, Cl. 198-168.000.

Hartford, Winslow H.: *See—*
Byers, Robert D.; and Hartford, Winslow H., 3,723,261.

Hartinger, Daniel J. Coded swizzle-stick. 3,722,457, Cl. 116-114.000.

Hartman, David A. Drawer side wall. 3,722,974, Cl. 312-330.000.

Hartmann, Hans Otto; and Schmidt, Karl-Walter, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,722,493, Cl. 123-8.070.

Haruna, Takashi; and Shimano, Akira, to Nissan Motor Company, Limited. Combination detector and switch device. 3,723,681, Cl. 200-61.530.

Harvey, Don E.: *See—*
Rohrberg, Roderick G.; and Harvey, Don E., 3,722,778.

Haskell, Barin Geoffry; and Limb, John Ormond, to Bell Telephone Laboratories, Incorporated. Variable frame rate recording system using speed measurement. 3,723,644, Cl. 178-6.60p.

Haskell, Vernon Charles, to Du Pont de Nemours, E. I., and Company. Dispersion polymerization of vinylidene chloride copolymers. 3,723,571, Cl. 260-836.000.

Hasse, Hans O., to United States of America, Air Force. Adjustable suspension unit. 3,722,875, Cl. 267-122.000.

Hasting Manufacturing Company: *See—*
Shaltis, Robert J.; and Woltjer, David, 3,722,683.

Hatch, Melvin J.; Yoshimine, Masao; Smith, Hugh B.; and Schmidt, Donald L., to Dow Chemical Company, The. Polymers from hydroxyarylmethylenesulfonium zwitterions. 3,723,386, Cl. 260-47.00r.

Haubner, John E.: *See—*
Davidson, Arthur R.; Haubner, John E.; and White, George A., 3,722,401.

Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., to Squibb, E. R., & Sons, Inc. Pyrazole derivatives. 3,723,424, Cl. 260-243.00r.

Hauser, Raimund: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.
Vockenhuber, Karl; and Keznickl, Eduard (said Keznickl assor. to), 3,723,003.

Hauser, William, to Du Pont de Nemours, E. I., and Company. Process for recording images with laser beams. 3,723,121, Cl. 96-27.000.

Hautaniemi, Bruno Wendell; Bowman, Robert A.; and Bangerter, Kenneth R., to Ithaco, Inc. Ultrasonic inspection apparatus. 3,722,263, Cl. 73-67.80s.

Hawker Siddeley Aviation Limited: *See—*
Cameron-Johnson, Alan, 3,722,894.

Hawkins, Harold V.; and Forys, Joseph E., to Columbus McKinnon Corporation. Overload prevention handle. 3,722,316, Cl. 74-524.000.

Hay, William J., Jr., to PPG Industries, Inc. Combined stain retardant and separator interleaving material for glass sheets. 3,723,312, Cl. 252-11.000.

Hayasaki, Hidehiko; and Hayashi, Takehiko, to Kabushiki Kaisha Tanaka Seisakusho. Gas cutting and marking device. 3,722,818, Cl. 239-85.000.

Hayashi, Jun; Ohi, Reiichi; Shishido, Tadao; and Kondo, Tokiharu, to Fuji Photo Film Co., Ltd. Process for the formation of color photographic images. 3,723,125, Cl. 96-56.200.

Hayashi, Takehiko: *See—*
Hayasaki, Hidehiko; and Hayashi, Takehiko, 3,722,818.

Hayashi, Yoshihiro, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Automatic locking device for a safety belt in a motor car. 3,722,824, Cl. 242-107.400.

Hayashi, Yukio, to Kabushiki Kaisha Kaikosha. Process for manufacturing weighted cord and the same. 3,723,221, Cl. 156-229.000.

Hayashibara Company: *See—*
Yokobayashi, Yasuyuki; and Masuda, Kazuo, 3,723,253.

Hayden, Paul Ross: *See—*
Dellecker, Raymond Whyte; Greason, William Wallace, III; Hayden, Paul Ross; and Weiner, David William, 3,723,661.

Hayek, Erich: *See—*
Pohler, Alfred; and Hayek, Erich, 3,722,462.

Hayes, Arthur William, to P & B Agencies (Proprietary) Limited. Bags. 3,722,377, Cl. 93-35.00h.

Hayes, John C., to Universal Oil Products Company. Dehydrogenation with a catalytic composite containing platinum, rhenium, germanium and an alkali or alkaline earth metal. 3,723,557, Cl. 260-668.00d.

Health Systems, Inc.: *See—*
Panico, Joseph J., 3,723,887.

Healy, James W., to Peters & Co., Inc. Dispensing apparatus. 3,722,970, Cl. 312-71.000.

Heaney, Donald F.: *See—*
Savage, Elton S.; and Heaney, Donald F., 3,722,836.

Heap, Alec John. Ignition switches. 3,723,678, Cl. 200-42.00a.

Heath, Ronald Alfred: *See—*
Thomas, Alan; and Heath, Ronald Alfred, 3,723,926.

Hebert, Francis A. Anti-jackknife device. 3,722,919, Cl. 280-432.000.

Heckelsberg, Louis F., to Phillips Petroleum Company. Conversion of olefins. 3,723,562, Cl. 260-683.00d.

Heckenlaible, Harry R. Hook unit for pickup trucks. 3,722,910, Cl. 280-179.00r.

Hecker, Klaus J., to United States of America, Navy. Image correlator with image shift detection capability. 3,723,799, Cl. 315-11.000.

Heckmaier, Joseph: *See—*
Fischer, Walter; and Heckmaier, Joseph, 3,723,610.

Hedeen, Nils E.; and Javenkoski, Carl W., to Harmischfeger Corporation. Hydraulic crane control to prevent uncontrolled falling of load. 3,722,707, Cl. 212-59.00r.

Hederich, Volker: *See—*
Gunter, Gehrke; Hederich, Volker; Harms, Wolfgang; and Wagner, Peter, 3,723,480.

Hefendehl, Hans Friedrich: *See—*
Zeischegg, Walter, 3,722,971.

Heflinger, Lee O., to TRW Inc. Acoustic imaging system. 3,723,958, Cl. 340-5.0mp.

Hegedus, Balthasar; and Zeller, Paul. (-) Threo-3-(4-hydroxy-3-methoxyphenyl)-serine. 3,723,514, Cl. 260-519.000.

Heil, Eduard: *See—*
Beer, Ludwig; Fischer, Hermann; and Heil, Eduard, 3,723,391.

Hein, Gary L.; and Larson, Roger R., to Lincoln Laboratories, Inc. One hand injector. 3,722,512, Cl. 128-220.000.

Heinrich, Frank-Armin; Prause, Dieter; and Sost, Rolf, to Bosch, Robert, Elektronik G.m.b.H. Facsimile transmission method and apparatus. 3,723,641, Cl. 178-6.000.

Heinz, William. Sewing thimble. 3,722,763, Cl. 223-101.000.

Heller, Rudolf. Bodies of low specific gravity. 3,723,232, Cl. 161-68.000.

Helmke, Kenneth L.: *See—*
Bixby, Douglas G.; and Helmke, Kenneth L., 3,723,131.

Helstrom, Carl W., Jr.: *See—*

Altar, William; and Helstrom, Carl W., Jr., 3,722,447.

Helvie, Gene B.: *See—*
Satkin, David M.; Helvie, Gene B.; and Tillotson, Charles J., 3,722,163.

Hemmie, Gerd: *See—*
Gritsch, Herbert; Meyerhoff, Herwig; Bruns, Enno; and Hemmie, Gerd, 3,723,959.

Henderson, Miles L., to Phillips Petroleum Company. Olefin feed purification in an alkylation process. 3,723,565, Cl. 260-683.430.

Hendrick, Clive A.: *See—*
Siddall, John B.; and Hendrick, Clive A., 3,723,467.

Henkel & Cie G.m.b.H.: *See—*
Von Freyhold, Helmut, 3,723,333.

Henneberg, Val G.: *See—*
Tidwell, Calvin M.; and Henneberg, Val G., 3,723,564.

Hennemuth, William R.: *See—*
Carson, Don B.; and Hennemuth, William R., 3,723,072.
Carson, Don B.; and Hennemuth, William R., 3,723,300.

Hennen, Roy Erving, to Globe-Union Inc. Filling and venting device for a storage battery. 3,723,188, Cl. 136-162.000.

Hennessy, John A., to Vendo Company, The. Coin handling apparatus. 3,722,653, Cl. 194-102.000.

Hennig, Fridolin: *See—*
Kremp, Rudolf; and Hennig, Fridolin, 3,722,828.

Henningsson, Karl Gosta, to Atlas Copco Aktiebolag. Pneumatic timing means. 3,722,526, Cl. 137-107.000.

Henrick, Clive A.: *See—*
Siddall, John B.; and Henrick, Clive A., 3,723,462.

Hentz, Donald A.: *See—*
Lang, William J.; and Hentz, Donald A., 3,723,310.

Heppes, Aladar: *See—*
Schmidt, Joseph; and Heppes, Aladar, 3,723,720.

Herbener, Henry M. Corselet or the like. 3,722,514, Cl. 128-533.000.

Herber, John F.; Street, Robert W.; and Richard, William R., Jr., to Monsanto Company. Functional fluid composition containing epoxide stabilizers. 3,723,320, Cl. 252-78.000.

Hercules Incorporated: *See—*
Craig, Alan D.; and Lukach, Carl A., 3,723,203.

Hernandez, Ralph, Jr., to Aircraft Instruments, Inc. Aircraft gyrohorizon indicator with signal lamp positional attitude indicating means. 3,723,963, Cl. 340-27.000.

Herolzer, Ralph H., to Vanguard Industries, Inc. Stackable and nestable container. 3,722,735, Cl. 220-97.00e.

Herrmanns, Peter, to FMN Schuster SA. Unwinding device for yarn spools. 3,722,826, Cl. 242-129.500.

Herter, George L., to Herter's Inc. Plastic shotshell with sealing rings. 3,722,411, Cl. 102-43.00p.

Herter, George L., to Herter's Inc. Polyethylene shotshell case. 3,722,412, Cl. 102-43.00p.

Herter, George L., to Herter's Inc. Tapered cup wad. 3,722,420, Cl. 102-95.000.

Herter's Inc.: *See—*
Herter, George L., 3,722,411.
Herter, George L., 3,722,412.
Herter, George L., 3,722,420.

Herty, Charles H., III, to North American Rockwell Corporation. Propellant casting. 3,722,354, Cl. 86-1.000.

Herwig, Walter: *See—*
Brinkmann, Ludwig; and Herwig, Walter, 3,723,574.

Herzberg, Claude, to Societe Generale des Produits Refractaires. Apparatus for feeding a gas furnace. 3,722,866, Cl. 263-40.00r.

Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Apparatus for reconverting foam to the initial liquid. 3,723,343, Cl. 252-361.000.

Heseltine, Donald W.: *See—*
Mee, John D.; and Heseltine, Donald W., 3,723,419.

Heseltine, Robert William; and Dawson, John Burt, to Pilkington Brothers Limited. Thermochromic composition of cobalt II chloride in cured polyester. 3,723,349, Cl. 252-408.000.

Hess, Hans-Jurgen E.: *See—*
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,723,434.

Hess, Martin S.: *See—*
Castrucci, Paul P.; Grochowski, Edward G.; Hess, Martin S.; and Zachos, Elias B., 3,723,200.

Hesston Corporation: *See—*
Bedwell, Thomas Albert; and McWhirt, Bobby Dwayne, 3,722,673.
Fell, Ferol S.; Goering, Lowell J.; and Long, William D., 3,722,277.

Hestrum Company: *See—*
Pierson, Raymond C., Jr.; and Voytko, Charles L., 3,722,906.

Hewitt, Gordon Trent, to Colgate-Palmolive Company. Shampoo of improved foaming and lathering power comprising higher fatty alcohol sulfate and substituted imidazoline. 3,723,360, Cl. 252-542.000.

Hewlett-Packard Company: *See—*
Kruger, William P.; and Turner, Wilson R., 3,723,729.

Hibabayashi, Satoshi: *See—*
Nagata, Yoshiaki; Higo, Yatuhiro; Hibabayashi, Satoshi; and Morozlmi, Eiichi, 3,723,153.

Hicks, James P.; Gramera, Robert E.; and Molotsky, Hyman M., to CPC International Inc. Preparation of acetone glucose. 3,723,412, Cl. 260-210.00r.

Hiestand, James C.; and Thies, Richard O., to Continental Drilling Company. Wall saw. 3,722,497, Cl. 125-14.000.

Higgs, Roland W., to Honeywell Inc. Acoustic decoupler. 3,722,619, Cl. 181-33.00g.

Higo, Yatuhiro: *See—*
Nagata, Yoshiaki; Higo, Yatuhiro; Hibabayashi, Satoshi; and Morozlmi, Eiichi, 3,723,153.

Hildenbrandt, August J., Jr.: *See—*
Breunich, Theodore R.; and Hildenbrandt, August J., Jr., 3,722,534.

Hill, George Edward; and Tomlin, Bruce Warren, to Singer Company, The. Monitor pressure regulator assembly. 3,722,536, Cl. 137-505.460.

Hill, Jack O.; Fridge, David S., Jr.; and Dibble, Vaughn R., Jr., to Oceanography International Corporation, mesne. Retrievable buoy. 3,722,014, Cl. 9-8.00r.

Hill, John L.: *See—*
Manchester, William E.; Morris, Carl M.; and Hill, John L., 3,722,068.

Hiller, Waldemar. Sound reproducing device for toys. 3,722,891, Cl. 274-22.000.

Hills, Jeffrey Mark. Toothbrush with concavity formed by bristle ends. 3,722,020, Cl. 15-167.00r.

Hilsabeck, Carl E.: *See—*
Crooke, Robert Curtis; and Hilsabeck, Carl E., 3,722,268.

Hinkle, Mary L.: *See—*
Brockett, Bruce W.; Miller, Robert E.; and Hinkle, Mary L., 3,723,156.

Hintergraber, Maximillian: *See—*
Frei, Gerhard; and Hintergraber, Maximillian, 3,722,578.

Hirai, Minoru: *See—*
Yoshida, Masatoshi; and Hirai, Minoru, 3,723,378.

Hirata, Hiroshi; and Toyoda, Hiroshi, to Asahi Giken Kabushiki Kaisha. Method for driving piles and like elements into the ground. 3,722,600, Cl. 173-1.000.

Hirohashi, Toshiyuki: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Hirose, Horiyasu; and Souda, Shigeru, to Eisai Co., Ltd. Indoline-2-one derivatives and preparation thereof. 3,723,457, Cl. 260-325.000.

Hirschberg, Erwin E.: *See—*
Dargatz, Theodore A.; and Hirschberg, Erwin E., 3,722,853.

Hirshfield, Stanley M.: *See—*
Hamermesh, Charles L.; and Hirshfield, Stanley M., 3,723,539.

Hit-Away, Inc.: *See—*
Ettinger, Donald N., 3,721,992.

Hitachi, Ltd.: *See—*
Fukuda, Kenji; and Honkawa, Tadashi, 3,723,008.
Masaki, Akira, 3,723,761.
Uchiyama, Yoshihiro; Nakano, Yoshiyuki; Kishigami, Takashi; and Arie, Ryosuke, 3,723,018.
Yuminaka, Takeo; Inuzuka, Isao; and Iwasaka, Tatsuo, 3,722,628.

Hitchcock, Robert D.; and McMahan, Gene P., to United States of America, Navy. Heat transfer system for radioisotope generators. 3,722,579, Cl. 165-47.000.

HMW Industries, Inc.: *See—*
Bergey, John M., 3,722,206.
James, John O., 3,722,419.

Ho, Irving T.: *See—*
Chen, Tien Chi; and Ho, Irving T., 3,723,715.

Ho, Raymond Y.-C.: *See—*
Adams, David K.; and Ho, Raymond Y.-C., 3,723,773.

Hoback, John T.; and Holub, Fred F., to General Electric Company. Siloxane containing prepolymers and polyamide-imides prepared therefrom. 3,723,385, Cl. 260-46.50e.

Hodge, William V.; and Lee, Charleston R., to General Foods Corporation. Shelf stable pastry product. 3,723,132, Cl. 99-92.000.

Hodgson, Robert F.: *See—*
Mazur, Joseph N.; Ratkay, Edward J.; and Hodgson, Robert F., 3,722,540.

Hoell, John, to Foster Transformer Company. Method of making electrical transformer means. 3,722,082, Cl. 29-605.000.

Hoellerich, John L., to Slingerland Drum Co. Drum pedal. 3,722,349, Cl. 84-422.00r.

Hoerr, Richard H.: *See—*
Butterfield, Max E.; Hoerr, Richard H.; McLees, Alan L.; and Proksch, Frederick D., 3,722,618.

Hoesch Aktiengesellschaft: *See—*
Milke, George, 3,722,261.

Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Segmented thermoplastic copolyesters modified with polyepoxides. 3,723,568, Cl. 260-835.000.

Hoeschele, Guenther Kurt, to Du Pont de Nemours, E. I., and Company. Blends of copolyesters with cured epoxy resins. 3,723,569, Cl. 260-835.000.

Hoey, Charles Edwin, to Rohn & Haas Company. Method of making non-woven pile fabric. 3,723,213, Cl. 156-72.000.

Hoffman, James C.: *See—*
Bonfich, William; and Hoffman, James C., 3,723,275.

Hoffman, Lionel B., to Pitney Bowes-Sage, Inc. Optical monitoring chamber unit for toner density controls. 3,722,559, Cl. 141-98.000.

Hoffman-La Roche, Inc.: *See—*
Berger, Julius, 3,723,254.

Hoffmann, Hans: *See—*
Leontaritis, Lambis; Schon, Nikolaus; and Hoffmann, Hans, 3,723,162.

Hoffmann, Oswald, to Hoffmann-Werke J. Oswald Hoffmann. Firing equipment for simulating the effect of the gunfire. 3,722,418, Cl. 102-70.20r.

Hoffmann-La Roche Inc.: *See—*
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,723,445.
Erlemann, Gustav; Sander, Manfred; and Zimmer, Gerhard, 3,723,616.
Miller, Oscar Neal, 3,723,623.

Hoffmann-Werke J. Oswald Hoffmann: *See—*
Hoffmann, Oswald, 3,722,418.

Hofling, Erich, to Swiss Aluminium Ltd. Method of producing tearing lines in metal containers. 3,723,269, Cl. 204-129.650.

Hofmann, Gottfried; and Schwartz, George F., to United States Steel Corporation. Method for removing an aborted casting from a continuous-casting machine. 3,722,575, Cl. 164-70.000.

Hogan, James J.; and Iler, Theodore W., to Goodyear Aerospace Corporation. Method and apparatus to effect normalized correlation. 3,723,717, Cl. 235-181.000.

Hoh, George L. K.; and Tuites, Donald E., to Du Pont de Nemours, E. I., and Company. Ethylene/vinyl ester/carboxylic acid copolymers. 3,723,397, Cl. 260-80.800.

Hokes, James J.: *See—*
Morine, Richard L.; and Hokes, James J., 3,722,560.

Holben, Eugene F.: *See—*
Metz, Thomas R.; and Holben, Eugene F., 3,722,265.

Holbrook, Douglas W.: *See—*
Scarpino, Theodore J.; and Holbrook, Douglas W., 3,723,805.

Holler, Howard V.: *See—*
Bauer, Ronald S.; and Holler, Howard V., 3,723,591.
Newey, Herbert A.; and Holler, Howard V., 3,723,361.

Hollstein, Elmer J.; and Brownstein, Arthur M., to Sun Oil Company. Process for aromatic lactams. 3,723,436, Cl. 260-281.000.

Holman, Egbert Willem: *See—*
Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, 3,723,336.

Holmes, Arthur J.: *See—*
Gill, Joseph G.; Gill, John H.; and Holmes, Arthur J., 3,722,718.

Holmstrom, John, Jr.: *See—*
Bushmeyer, Richard W.; and Miller, Charles D., 3,723,129.

Holt, Jan D.; and Smith, Garth R., to ACF Industries, Incorporated. Inflatable bulkhead assembly for railway freight cars. 3,722,429, Cl. 105-39.0ba.

Holt, William David, to Lucas, Joseph, (Industries) Limited. Electrical systems for road vehicles. 3,723,751, Cl. 307-10.00r.

Holtz, Hans D., to Phillips Petroleum Company. Olefinic borate esters. 3,723,495, Cl. 260-462.00a.

Holtz, Klaus E. Data collection apparatus and method. 3,723,974, Cl. 340-172.500.

Holub, Fred F.: *See—*
Hoback, John T.; and Holub, Fred F., 3,723,385.

Holzer, Gerold: *See—*
Gemein, Rudolf; and Holzer, Gerold, 3,722,965.

Homestead, Ronald E.: *See—*
Homestead, Ronald E.; and Poulter, Thomas C. (said Poulter assor. to said), 3,722,472.

Homestead, Ronald E.; and Poulter, Thomas C., said Poulter assor. to said Homestead, Ronald E. Method for branding animals. 3,722,472, Cl. 119-1.000.

Hon Industries Inc.: *See—*
De Priester, Donald Jack; Horney, David C.; and Mangels, Robert H., 3,722,613.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Arakawa, Tsuneaki, 3,722,529.
Maeda, Noriyuki, 3,722,491.
Oguma, Tomio, 3,722,646.
Ohama, Yasumichi; and Kogure, Hiroshi, 3,722,487.
Shibata, Yasuo, 3,722,492.

Honda, Toshio: *See—*
Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, 3,723,239.

Honey, Francis J.: *See—*
Harrison, Lee, III; Wells, Frank David; and Honey, Francis J., 3,723,803.

Honeywell Inc.: *See—*
Higgs, Roland W., 3,722,619.
Kardashian, Vahram S., 3,723,988.
Kruse, Paul W.; and Schmit, Joseph L., 3,723,190.
Wenzel, Lyle John, 3,723,689.

Honeywell Information Systems, Inc., mesne: *See—*
Kennedy, James A., 3,723,973.
Stange, Klaus K., 3,723,981.

Honkawa, Tadashi: *See—*
Fukuda, Kenji; and Honkawa, Tadashi, 3,723,008.

Honn, James B.; and Jacobs, Paul E., to National Distillers and Chemical Corporation. Combined closure and handle for a thermoplastic bag and method of producing same. 3,722,786, Cl. 229-54.00r.

Hooker Chemical Corporation: *See—*
Currey, John E.; and Ruthel, Walter W., 3,723,266.
Robota, Stephen, 3,723,272.

Hooper, Bernard: *See—*
Issigonis, Alec Arnold Constantine; and Hooper, Bernard, 3,722,612.

Hooper, Gilman S.; and Springer, Alois H., to Deering Milliken Research Corporation. One pass continuous dyeing of polyester/cellulosic fibers a plurality of colors. 3,723,055, Cl. 8-21.00c.

Hoover Ball and Bearing Company: *See—*
Atchley, Richard C., 3,722,743.

Hopkins, Stephen: *See—*
O'Leary, Timothy W.; and Hopkins, Stephen, 3,722,561.

Hoppmann Corporation: *See—*
Hoppmann, Kurt H.; and Schober, Horst A., 3,722,674.

Hoppmann, Kurt H.; and Schober, Horst A., to Hoppmann Corporation. Apparatus for sorting particulate articles. 3,722,674, Cl. 209-73.000.

Hopwood, Norman W., Jr.: *See—*
Bogart, Harold N.; Hopwood, Norman W., Jr.; Pearson, Archie A.; and Whitacre, Foster E., 3,722,257.

Horan, John J. Method for functionable structural accommodation of snap-in electric lamps. 3,722,088, Cl. 29-629.000.

Hordijk, Adrianus, to Hordijk, G., Houtindustrie Zaandam N.V. Package handling. 3,722,176, Cl. 53-376.000.

Hordijk, G., Houtindustrie Zaandam N.V.: *See—*
Hordijk, Adrianus, 3,722,176.

Hordis Bros., Inc.: *See—*
Hall, Alvin R., 3,722,572.

Horeschi, Giancarlo: *See—*
Barozzi, Gian Piero; and Horeschi, Giancarlo, 3,722,795.

Horgan, William J., Jr., to Blumcraft of Pittsburgh. Combined hinge and glass door unit. 3,722,029, Cl. 16-129.000.

Horney, David C.: *See—*
De Priester, Donald Jack; Horney, David C.; and Mangels, Robert H., 3,722,613.

Hornsten, Karl Herald, to Nya Asfalt AB. Drilling equipment, especially for drilling in earth or loose rock. 3,722,610, Cl. 175-386.000.

Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., to Rohm & Haas Company. N-(1,1-dimethylpropynyl)-3,5-dichloro-4-methylbenzamide. 3,723,523, Cl. 260-558.00d.

Horton, Richard F., to United States of America, Navy. Water-cooled cholesteric liquid crystal infrared imaging device. 3,723,739, Cl. 250-83.30h.

Horvitz, Leo. Geochemical prospecting in submerged areas. 3,722,271, Cl. 73-170.00a.

Hotchner, Fred. Apparatus for indicating the direction to a sound pulse source. 3,723,962, Cl. 340-16.00r.

Hotze, Hermann: *See—*
Reese, Johannes; and Hotze, Hermann, 3,723,572.

Hotze, Robert E., to Western Electric Company, Incorporated. Method of securing flat integrated circuits to printed wiring boards and a support device therefor. 3,723,943, Cl. 339-17.0cf.

Houdry, Jacques H., to Oxy-Catalyst Inc. Catalytic oxidation apparatus. 3,723,070, Cl. 23-288.00f.

Houlihan, William J.: *See—*
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,723,620.

Houlihan, William J., to Sandoz-Wander, Inc. Dichloro trifluoromethyl benzoic acids as agrochemical agents. 3,723,090, Cl. 71-115.000.

Housayama, Akira, to Tsunoda Jitensah Kabushiki Kaisha. Folding bicycle. 3,722,912, Cl. 280-287.000.

Housayama, Akira, to Tsunoda Jitensha Kabushiki Kaisha. Folding bicycle. 3,722,913, Cl. 280-287.000.

Hovermale, Ralph Allen; Ostapchenko, George Joseph; and Yang, Hung Han, to Du Pont de Nemours, E. I., and Company. Orientation of tubular polypropylene film. 3,723,583, Cl. 264-40.000.

Hovick, Jack H., 1/3% to Gambrell, James B. Apparatus for collection of urine in females. 3,722,503, Cl. 128-2.00f.

Howard Associates, Inc.: *See—*
Howard, Homer E., 3,722,489.

Howard, Homer E., to Howard Associates, Inc. Electronic relay and ignition system utilizing same. 3,722,489, Cl. 123-148.00e.

Howard Manufacturing Company: *See—*
Howard, Paul N., 3,722,431.

Howard, Paul N., to Howard Manufacturing Company. Slat panel furniture. 3,722,431, Cl. 108-153.000.

Howard, Terence E.: *See—*
Walden, Cecil C.; and Howard, Terence E., 3,723,255.

Howard Wall Limited: *See—*
Esner, Mark Edward, 3,722,909.

Howell, Robert G.; and Panzarino, Joseph N., to Corning Glass Works. Ion-exchange strengthened, electrically-heated glass. 3,723,080, Cl. 65-30.000.

Howland, Dennis L.: *See—*
Powell, Walter W.; and Howland, Dennis L., 3,722,852.

Hrescak, Stan, to B. C. Gearworks Ltd. Fairlead carriage. 3,722,827, Cl. 242-158.40r.

Hrynda, Helen R. Portable crib. 3,722,009, Cl. 5-93.000.

Huck Manufacturing Company: *See—*
Van Hecke, George J.; and Masinda, Albert G., 3,722,329.

Huder, Guido: *See—*
Reich, Arturo; and Huder, Guido, 3,722,823.

Hudson Products Corporation: *See—*
Johnson, Glenn H., 3,722,317.

Huebner, Werner P. E.; and Long, Robert C., to D.D.I. Communications, Inc. Extendable multiplexer. 3,723,658, Cl. 179-15.00r.

Hug, Richard C., to Clayton Corporation. Dispensing valve having positive tilt stem. 3,722,760, Cl. 222-402.220.

Huggins, James A., to Baxter Laboratories, Inc. Apparatus for adding medicaments to a sealed expandable parenteral fluid container. 3,722,557, Cl. 141-59.000.

Hughes Aircraft Company: *See—*
Andrews, George J.; and Rosen, Harold A., 3,722,840.
Dahlinger, Rodney J., 3,723,756.
Laakmann, Peter, 3,723,642.
Laakmann, Peter, 3,723,908.
O'Brien, Lawrence H., 3,723,798.
Seliger, Robert L.; and Wilson, Robert G., 3,723,733.
Weber, Joseph; Zipoy, David M.; and Forward, Robert L., 3,722,284.
Weber, Joseph, 3,722,285.
Weber, Joseph, 3,722,286.
Weber, Joseph, 3,722,287.
Weber, Joseph, 3,722,288.
Weber, Joseph, 3,722,289.
Weber, Joseph; and Zipoy, David M., 3,722,290.

Hughes, George W. Inner tube sealing means. 3,722,569, Cl. 152-429.000.

Hughes, Robert G.; and Ruetz, Lloyd B., to Continental Can Company of Canada Limited. Carrier for containers. 3,722,737, Cl. 220-113.000.

Hull, James R. Furniture formed of arcuate and cylindrical members. 3,722,953, Cl. 297-445.000.

Hull, R. O., & Company, Inc.: *See—*
Rosenberg, William E., 3,723,263.

Hulst, Raymond H. High chair forming apparatus. 3,722,047, Cl. 29-34.00d.

Hultgren, Frank A.; and Kot, Richard A., to Republic Steel Corporation. Method of providing superplastic steel and of producing articles by deformation thereof. 3,723,194, Cl. 148-12.000.

Humlong, Robert F., to Wald Manufacturing Company, Incorporated. Bicycle handlebar stem. 3,722,930, Cl. 287-54.00e.

Hummel, Karl Frederick, to Du Pont de Nemours, E. I., and Company. Process for hardening photogardenable images. 3,723,120, Cl. 96-35.100.

Hungerford, Philip C., Jr.; and Richens, Robert H., to Cole National Corporation. Key cutter. 3,722,341, Cl. 83-413.000.

Hunt, Charles D. A., to Airco Inc. Method of manufacturing iron base alloys. 3,723,098, Cl. 75-12.000.

Hunt, Charles D'A., to Airco Inc. Iron base alloys having low levels of volatile metallic impurities. 3,723,101, Cl. 75-126.00r.

Hunt, Leland F.; and Lago, Julio R., to Kaiser Aluminum & Chemical Corporation. Aluminum reduction cell. 3,723,286, Cl. 204-243.00r.

Hunter, Raymond E., to Ocean Design Engineering Corporation. Method for separating oil from water surface. 3,723,307, Cl. 210-33.000.

Hurlburt, Charles E.; and Lanni, Michael J., to Bendix Corporation, The. Antifriction bearing with compensating flexural pivot in a free axis gyroscope. 3,722,296, Cl. 74-5.000.

Hurlburt, Joseph C., to Sperry Rand Corporation. Cutter bar for mower. 3,722,195, Cl. 56-245.000.

Hurst, Gerald L., to Kinetics International Corporation. Method of petonating an ammonium nitrate liquid fuel composition with a number 6 cap. 3,722,410, Cl. 102-23.000.

Husky Manufacturing & Tool Works Limited: *See—*
Rees, Herbert, 3,723,040.

Hutsinger, Dean P., to Collins Radio Company. Digital harmonic rejecting phase detector. 3,723,890, Cl. 329-50.000.

Hutton, Walter C. Fusion tool. 3,723,229, Cl. 156-580.000.

Hycel, Inc.: *See—*
Jones, Gerald M.; and Laird, Cleve W., 3,723,063.
Moran, John J., 3,723,066.

Hydraulic Industries, Inc.: *See—*
Tennis, Francis H., 3,722,543.

I-T-E Imperial Corporation: *See—*
Cuorato, John; and Stull, Charles V., 3,723,824.
Pietramale, Anthony M., 3,722,292.
Shaffer, Howard R.; and Strobel, Albert, 3,723,924.
Zocholl, Stanley E., 3,723,818.

Iascone, Michael. Wire bending tool. 3,722,256, Cl. 72-470.000.

Ichihara, Hiroshi: *See—*
Toyooka, Tadao; Nishida, Takeo; and Ichihara, Hiroshi, 3,723,187.

Icking, Paul; and Ridder, Hubert. Device for transporting pre-measured amounts of feed. 3,722,761, Cl. 222-409.000.

Ideal Toy Corporation: *See—*
Thorn, Herbert; and Berkin, Harvey, 3,722,136.

Igarashi, Yoshikazu; Bessho, Yoshio; Kiroku, Yoshikazu; and Takahashi, Yasuo, to Kuraray Co., Ltd. Electrically conductive threads and method of manufacturing clothing exhibiting anti-static properties therewith. 3,722,440, Cl. 112-262.000.

Iguchi, Sigeru: *See—*
Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, 3,723,127.

Ihrke, Elmer A.; and Ihrke, Walter R. Pitch measurement circuit. 3,722,352, Cl. 84-454.000.

Ihrke, Walter R.: *See—*
Ihrke, Elmer A.; and Ihrke, Walter R., 3,722,352.

Iler, Theodore W.: *See—*
Hogan, James J.; and Iler, Theodore W., 3,723,717.

Ilford Limited: *See—*
Mac Donald, Eric; and Campbell, Frederic, 3,723,128.

Illingworth, George E.: *See—*
Massie, Stephen N.; and Illingworth, George E., 3,723,303.

Illinois Tool Works Inc.: *See—*
Jaeger, Joseph H., 3,722,037.

Imajima, Mituhiro: *See—*
Nakashima, Akhiko; Imajima, Mituhiro; and Murase, Shigeo, 3,723,052.

Imamura, Hiroshi: *See—*
Nakanishi, Michio; Muro, Tomio; Imamura, Hiroshi; and Yamaguchi, Nobuharu, 3,723,476.

Impact, Inc.: *See—*
Tauscher, Henry, 3,723,033.

Imperial Chemical Industries Limited: *See—*
Backhouse, Margaret Peddie; Topham, Arthur; and Tury, Bernard, 3,723,151.
Colchester, John Edward; and Blundell, Thomas, 3,723,444.
Erskine, James Brian, 3,722,620.
Greaves, Jeffrey Chester; and Oakes, William George, 3,723,403.
Jones, Michael Edward Benet; and Jarrett, Graham, 3,723,396.

Improved Machinery Inc.: *See—*
Vogel, Karl E., 3,723,243.

Inaba, Shigeho: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Indarte, Rafael Audivert, to United States of America, Agriculture. Spinning a filament-wrapped staple fiber core yarn. 3,722,202, Cl. 57-144.000.

Indo, Masahiro: *See—*
Kawabata, Norio; Indo, Masahiro; and Nishibayashi, Nobuhiko, 3,722,523.

Indra, Jaromir; and Opatril, Vaclav, to Elitex, Zavody textilniho strojirenstvi generalni reditelstvi. Hydraulic weft inserter drive in weaving machines. 3,722,552, Cl. 139-144.000.

Industrial Filter & Pump Mfg., Co.: *See—*
Schmidt, Henry, Jr., 3,722,539.

Industrie Pirelli S.p.A.: *See—*
Maiocchi, Luigi, 3,722,568.

Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Schinzel, Fidelius; and Schwannecke, Helmut, 3,722,438.

Industries, C. R.: *See—*
Harris, Joseph Warren, 3,722,065.

Industries Pirelli Societa per Azioni: *See—*
Sarracino, Marcello; Ferrentino, Antonio; and Borroni, Andrea, 3,722,775.

Industriewerk Schaeffer OHG: *See—*
Spiess, Karl, 3,722,066.

Inficon Inc.: *See—*
Lu, Chih-Shun, 3,723,778.

Information Magnetics Corporation: *See—*
Gillum, Donald E., 3,723,779.
Gillum, Donald E., 3,723,780.

Information Storage Systems, Inc.: *See—*
Sordello, Frank J., 3,723,766.

Inland Steel Company: *See—*
Kienle, Raymond P.; Bass, Gerald R.; Deegan, James J.; and Kiwiets, Johannes, 3,722,657.

Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, to Ciba-Geigy A.G. Production of azomethine pigments. 3,723,490, Cl. 260-438.100.

Innocenti Societa Generale per l'Industria Mettallurgica & Meccanica: *See—*
Passoni, Teresio, 3,722,246.

Inoue, Kiyoshi; and Shimizu, Akihiko, to Inoue-Japax Research Incorporated. Method of spatulating packaged dental filling. 3,722,833, Cl. 259-72.000.

Inoue, Yoshimitsu, to Minolta Camera Kabushiki Kaisha. Control device for motor driven motion picture camera. 3,722,989, Cl. 352-137.000.

Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 3,722,833.

Inscho, Leland S., Jr.: *See—*
Kesinger, Donald A.; and Inscho, Leland S., Jr., 3,722,137.

Institut Biofiziki: *See—*
Mikheev, Nikolai Borisovich; Gracheva, Maia Arkadievna; Bogomolova, Ljubov Grigorievna; and Levin, Valentin Ilich, 3,723,612.

Institut Khimii Drevesing Akademii Nauk Latviiskoi SSR: *See—*
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.

Institute of Gas Technology: *See—*
Borucka, Alina Z.; Marianowski, Leonard G.; and Baker, Bernard S., 3,723,186.

Institutul de Petrol, Gaze Si Geologie: *See—*
Veceslav, Harnaj D., 3,722,138.

Intercole Automation, Inc.: *See—*
Matsuoka, James T.; and Cantarutti, Armindo, 3,723,039.

Internation Telephone and Telegraph Corporation, mesne: *See*—
Gezari, Walter A., 3,722,538.
International Air Conditioning: *See*—
Braver, Alvin Stanley, 3,722,580.
International Business Machines Corporation: *See*—
Alvarez, Joseph A.; and Barner, Robert P., Jr., 3,723,976.
Bardell, Paul H., 3,723,837.
Betts, William K.; and Sawtschenko, Alexander P., 3,723,971.
Castrucci, Paul P.; Grochowski, Edward G.; Hess, Martin S.; and Zachos, Elias B., 3,723,200.
Chen, Tien Chi; and Ho, Irving T., 3,723,715.
Coburn, Ronald L.; and Roth, Oyvind, 3,723,748.
Crouse, William G.; and Jones, John E., 3,723,710.
Johnston, David L.; and Nyberg, Marvin E., 3,722,879.
Kuriz, Hobart L., Jr.; Smith, Glenn H.; and Wolff, Charles H., 3,723,975.
Singer, Frederick W., 3,722,655.
Vora, Madhukar B., 3,723,199.
International Dynetics Corporation: *See*—
Longo, Joseph F., 3,722,403.
International Flavors & Fragrances Inc.: *See*—
Brodnitz, Michael H.; and Pascale, John V., 3,723,135.
Evers, William John, 3,723,475.
International Harvester Company: *See*—
Zurek, James W.; and Fulghum, David A., 3,722,642.
International Liquid Xtal Company: *See*—
Taylor, Ted R.; and Fergason, James L., 3,723,346.
International Minerals & Chemical Corporation: *See*—
Lang, William J.; and Hentz, Donald A., 3,723,310.
International Nickel Company, Inc., The: *See*—
Benjamin, John Stanwood, 3,723,092.
Cairns, Robert Lacock; and Benjamin, John Stanwood, 3,723,109.
Larson, Floyd Gotthard, Jr., 3,722,073.
Richards, Edward Gordon; Fontaine, Paul Isidore; and Fleetwood, Michael John, 3,723,107.
Twigg, Peter Lindsay; and Parry, Philip James, 3,723,108.
International Nickel Company, The: *See*—
Evans, David, 3,722,464.
International Paper Company: *See*—
Bartley, Thomas S.; and Wagenknecht, Paul A., 3,722,469.
International Playtex Corporation: *See*—
Kaspar, Peter D., 3,722,467.
International Rectifier Corporation: *See*—
Collins, Howard William, 3,723,769.
Jacksen, Niels F., 3,723,210.
International Standard Electric Corporation: *See*—
Barnes, George John Preston, 3,723,897.
Francois, Maurice; and Denis, Marcel, 3,723,806.
International Telephone and Telegraph Corporation: *See*—
Batey, Robert W.; and Welte, Theodore J. R., 3,723,865.
Beese, Norman C.; and Malloy, James J., Jr., 3,723,783.
Donahue, Thomas H., 3,723,870.
Furlani, Romeo, 3,722,545.
Greenwood, Roger, 3,723,684.
Talmo, Robert Eugene; Ham, Donald L.; and Leyrer, Lowell J., 3,722,264.
Inuzuka, Isao: *See*—
Yuminaka, Takeo; Inuzuka, Isao; and Iwasaka, Tatsuo, 3,722,628.
Ion, Forrest Fothergill; Polanin, Walter Richard; and Altherr, Russell George, to Amsted Industries Incorporated. Reduced slack coupler. 3,722,708, Cl. 213-151.000.
IPCUP-Institutul de Proiectari si Cercetari Utilaj Petrolier: *See*—
Radulescu, Valentin, 3,722,331.
Iron Mountain, Inc.: *See*—
Casper, Lee A., 3,723,212.
Irving Industries (Foothills Steel Foundry Division): *See*—
Jette, George Alderic, 3,722,806.
ISE Electronics Corporation: *See*—
Tanji, Mikiharu, 3,723,789.
Isham, Carroll E., to Scientific Drilling Controls. Apparatus and method for determining relative orientation of two wells. 3,722,605, Cl. 175-40.000.
Ishida, Iwao: *See*—
Wada, Masamichi; Ishida, Iwao; and Nakagawa, Isamu, 3,723,354.
Ishida, Masayuki: *See*—
Fujii, Seiji; Uwamoto, Hiroshi; Ishida, Masayuki; and Kamata, masamoto, 3,722,244.
Ishida, Mitsuo. Aerosol spray container. 3,722,749, Cl. 222-61.000.
Ishikawa, Masakazu: *See*—
Ogasawara, Takeo; and Ishikawa, Masakazu, 3,722,634.
Ishikawa Tekko Kabushiki Kaisha: *See*—
Uchida, Yasuo, 3,722,931.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Itoh, Isamu; and Nakazono, Fumio, 3,722,863.
Ishizumi, Kikuo: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.
Ismail, Roshdy, to Dynamit Nobel Aktiengesellschaft. Chemical and thermal stabilities and fire resistance of synthetic resinous bodies. 3,723,172, Cl. 117-138.80a.
Issigonis, Alec Arnold Constantine; and Hooper, Bernard, to Norton Villiers Limited. Chain driven vehicles. 3,722,612, Cl. 180-32.000.
Itek Corporation: *See*—
Cunha, Harold; Dickman, William M.; and Robbins, Daniel H., 3,722,999.
Ithaco, Inc.: *See*—
Hautaniemi, Bruno Wendell; Bowman, Robert A.; and Bangerter, Kenneth R., 3,722,263.
Itin, Artur Markovich; and Agishtein, Ernst Khaimovich, to Moskovsky Stankostroitelny Zavood. Vertical multiple spindle machine. 3,722,049, Cl. 29-38.00a.
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, to Sumitomo Chemical Company, Ltd. Continuous process for manufacturing O, O-dialkyl-chlorothiophosphate. 3,723,580 Cl. 260-974.000.
Itoh, Isamu; and Nakazono, Fumio, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Lift apparatus. 3,722,863, Cl. 254-105.000.
Itoh, Noboru: *See*—
Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, 3,723,127.
Ivanov, Vasily Sergeevich: *See*—
Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, 3,723,853.
Iwano, Haruhiko; Tanaka, Mitsugu; Otsuki, Tetsuo; and Arai, Atsuaki, to Fuji Photo Film Co., Ltd. Diffusion transfer process for photographic silver halide emulsion. 3,723,118, Cl. 96-29.000.
Iwasaka, Tatsuo: *See*—
Yuminaka, Takeo; Inuzuka, Isao; and Iwasaka, Tatsuo, 3,722,628.
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, to Tokyo Shoketsu Kinzoku Kabushiki Kaisha. Elimination of the grinding of calcined ferrite in the production of anisotropic magnets. 3,723,587, Cl. 264-6.000.
Iwata, Masayoshi: *See*—
Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, 3,723,680.
Iwatsu Electric Company, Ltd.: *See*—
Nakaya, Naohisa, 3,723,762.
Ixer, Bernard W.; and Baughman, Davis Lee, to Carborundum Company, The. Work carrier for abrasive cleaning arrangements. 3,722,710, Cl. 214-1.0ba.
Jablonski, Jan, to Elliott Brothers (London) Limited. Apparatus for measuring fluid flow. 3,722,279, Cl. 73-231.00m.
Jacksen, Niels F., to International Rectifier Corporation. Method of making a semiconductor wafer having concave rim. 3,723,210, Cl. 156-11.000.
Jackson, Harold W.; Olmstead, Merlin E.; and Fickenscher, William E., to Bendix Corporation, The. Digital phase tracker. 3,723,714, Cl. 235-152.000.
Jackson, Richard H.; and Bak, Harry B., to Gits Bros., Mfg., Co., Inc. Dip stick. 3,722,102, Cl. 33-126.70r.
Jackson, Winston J., Jr.: *See*—
Bell, Alan; and Jackson, Winston J., Jr., 3,723,388.
Jacobs, Paul E.: *See*—
Honn, James B.; and Jacobs, Paul E., 3,722,786.
Jacobson, Nathaniel J. Fine and graphics arts products for enabling amateurs and others to select and utilize color materials with optical results of increased predictability. 3,722,109, Cl. 35-28.500.
Jacobson, Peter E.: *See*—
Duncan, Damon H.; and Jacobson, Peter E., 3,722,297.
Jacobson, Richard W. Play toy for use with miniaturized vehicles. 3,722,135, Cl. 46-244.00a.
Jacobus, Johannes; Schats, Cornelis; and Schenk, Hendrik, to Koninklijke Zwavelzuurfabrieken Voorheen Ketjen N.V. Elastomeric mixtures vulcanizable to electrically conductive vulcanisates and methods of preparing the same. 3,723,355, Cl. 252-511.000.
Jaeger, Joseph H., to Illinois Tool Works Inc. Locating plug. 3,722,037, Cl. 24-73.0pf.
Jaeger, Raymond E.; and Nickell, Robert Ernest, to Bell Telephone Laboratories, Incorporated. Devices for processing molten metals. 3,722,821, Cl. 239-133.000.
Jaeger, Robert O., to Unity Manufacturing Co. Beacon signaling devices. 3,723,725, Cl. 245-46.590.
Jaffe, Richard M.; and Parente, Robert B., to System Development Corporation. Simulation through rotating coordinate transformation. 3,723,718, Cl. 235-185.000.
Jakobi, Wilhelm; Kumper, Ernst; and Wagner, Hans, to Koppers, Heinrich, G.m.b.H. Industrial furnace. 3,723,054, Cl. 263-15.00r.
James, John O., to HMW Industries, Inc. Arming device for missiles. 3,722,419, Cl. 102-78.000.
James, Robert E., Sr. Mail box signal. 3,722,460, Cl. 116-132.000.
Jankelson, Bernard. Method of accurately and precisely constructing artificial dentures. 3,722,099, Cl. 32-32.000.
Japan Atomic Energy Research Institute: *See*—
Kojima, Gen; and Tabata, Yoneho, 3,723,270.
Japan Monopoly Corporation: *See*—
Suwa, Koichiro; Satoh, Haruki; and Shida, Atsuo, 3,722,516.
Jarratt, Robert L., Momories, Inc.: *See*—
Myers, Charles F.; and Platter, Sandford (said Myers assor. to), 3,723,053.
Jarrett, Graham: *See*—
Jones, Michael Edward Benet; and Jarrett, Graham, 3,723,396.
Jarva, Inc.: *See*—
Snyder, Larry L.; and Matlack, James R., 3,722,957.

Jaspers, Hans: *See—*
Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, 3,723,336.

Javenkoski, Carl W.: *See—*
Hedeen, Nils E.; and Javenkoski, Carl W., 3,722,707.

Jaybee Manufacturing Corporation: *See—*
Smith, Tom E., 3,722,030.

Jeffers, James Michael: *See—*
Jeffers, William; and Jeffers, James Michael, 3,722,556.

Jeffers, William; and Jeffers, James Michael. Rolling pipe line assembly, system and method. 3,722,556, Cl. 141-2.000.

Jefferson Chemical Company, Inc.: *See—*
Pitts, James William; and Steele, Charles Sam, 3,723,529.
Speranza, George Phillip; and Moss, Philip Hotchkiss, 3,723,365.

Jeger, Iskar; Wehrli, Hans Ueli; and Schaffner, Kurt, to Ciba-Geigy Corporation. Process for the manufacture of beta-hydroxy-steroid. 3,723,418, Cl. 260-239.55r.

Jenaer Glaswerk Schott & Gen.: *See—*
Faulstich, Marga; and Neuroth, Norbert, 3,723,143.

Jenkins, Philip W., to Eastman Kodak Company. 2-Imino-3-thiazoline cyanine dyes. 3,723,422, Cl. 260-240.00e.

Jensen, Jay E. Fishing lure. 3,722,129, Cl. 43-42.030.

Jentges, Heribert; and Burz, Oskar, to Siemens Aktiengesellschaft. Combined specimen removal and vacuum distillation apparatus. 3,722,872, Cl. 266-34.00r.

Jepson, John W.: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis Des., 3,722,887.

Jerrold Electronics Corporation: *See—*
Rogers, Donald H., 3,723,774.

Jette, George Alderic, to Irving Industries (Foothills Steel Foundry Division). Crusher jaw. 3,722,806, Cl. 241-291.000.

Jimenez, James A. Taco shell fryer. 3,722,400, Cl. 99-353.000.

John, Robert S., Jr., to Bell & Howell Company. Apparatus for recording television images on film. 3,723,647, Cl. 178-6.70r.

Johns, Antony; Tiley, Michael; and McDonnell, Patrick, to Production Engineering Research Association of Great Britain. Electrochemical machining. 3,723,268, Cl. 204-129.100.

Johns-Manville Corporation: *See—*
Whalen, James Joseph, 3,722,201.

Johnson & Johnson: *See—*
Korpman, Ralf, 3,723,170.

Johnson, Charles Wayne: *See—*
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne, 3,722,589.
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne, 3,722,594.

Johnson, Dale W.; Grounds, Robert B.; and Langford, Donald C., to D.B.F.D. Enterprises. Beverage mixer and dispenser. 3,723,851, Cl. 222-132.000.

Johnson, Frank B.: *See—*
Mann, Ralph W.; and Johnson, Frank B., 3,722,409.

Johnson, Frank J.; Walker, Nelson L.; and Ross, John P., to Select-Au-Matic; a partnership composed of Dyna-Craft, Inc. and Samp, Inc. Selective plating system. 3,723,283, Cl. 204-206.000.

Johnson, Glenn H., to Hudson Products Corporation. Apparatus for controlling movement between relatively reciprocable bodies. 3,722,317, Cl. 74-527.000.

Johnson, Harry T.; and Mitchell, Robert K., to Battelle Development Corporation. Vane end and tip assembly. 3,723,034, Cl. 418-268.000.

Johnson, Lloyd E.: *See—*
Carter, Carl W.; and Johnson, Lloyd E., 3,722,213.

Johnson, Mead, & Company: *See—*
Matier, William L.; and Comer, William T., 3,723,627.

Johnson, Olin B.; and Labana, Santokh S. Unsaturated graded-rubber and vinyl monomer paint. 3,723,166, Cl. 117-93.310.

Johnson, Ray M., to Microdry Corporation, mesne. Microwave applicator with time-sharing of magnetron sources. 3,723,900, Cl. 331-55.000.

Johnson, S. C., & Son, Inc.: *See—*
Morgan, Lee W.; and Rogers, John R., 3,723,358.

Johnson, S.C., & Son, Inc.: *See—*
Morgan, Lee W.; and Desai, Shrikrishna N., 3,723,323.

Johnson Service Company: *See—*
McLean, Michael B., 3,723,771.

Johnson, Wendell C.; Gomez, Nicolas G.; and Foret, Claude H., to Xerox Corporation. Method of making a plated wire memory plane. 3,722,083, Cl. 29-604.000.

Johnston, David L.; and Nyberg, Marvin E., to International Business Machines Corporation. Control apparatus for document stackers. 3,722,879, Cl. 271-47.000.

Jonas, Frank D.: *See—*
Chitester, John Alvin; and Jonas, Frank D., 3,722,964.

Jones, Bill F., to Smoot-Holman Company. Lighting system utilizing high intensity discharge lamps. 3,723,808, Cl. 315-95.000.

Jones, Cecil R., to Transfer Systems Incorporated. Apparatus for securing the bolts of the reactor pressure vessel head to the reactor pressure vessel. 3,722,332, Cl. 81-57.380.

Jones, Duane A.: *See—*
Nordgren, Robert; Jones, Duane A.; and Wittcoff, Harold A., 3,723,408.

Jones, Gerald M.; and Laird, Cleve W., to Hycel, Inc. Process for determination of chemical constituents of proteinaceous biological fluids. 3,723,063, Cl. 23-230.00b.

Jones, Herbert Francis, to Treadwell Corporation. Method of hoisting and anchoring heavy structures in a building. 3,722,170, Cl. 52-745.000.

Jones, John E.: *See—*
Crouse, William G.; and Jones, John E., 3,723,710.

Jones, John P. Adjustable ski pole with split retainer ring. 3,722,903, Cl. 280-11.37f.

Jones, Mattie Lou. Ladder bench. 3,722,621, Cl. 182-118.000.

Jones, Michael Edward Benet; and Jarrett, Graham, to Imperial Chemical Industries Limited. Catalytic production of polyamides from aromatic diamines. 3,723,396, Cl. 260-78.00r.

Jones, Rexford W.; and Thompson, William B., to Staley, A. E., Manufacturing Company. Multi-color reproductions. 3,723,123, Cl. 96-48.000.

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Jones, Richard K. Apparatus for dislodging skulls from slag or cinder ladles. 3,722,868, Cl. 266-1.00s.

Jones, Smiley H.: *See—*
Labonte, Roland J.; and Jones, Smiley H., 3,722,335.

Joos, Alfred, to Merck Patent Gesellschaft mit beschrankter Haftung. Pesticidal 1-amino-1-mercapto-2-cyano-ethane derivatives. 3,723,498, Cl. 260-465.400.

Joos, Erhard. Manhole cover construction. 3,722,730, Cl. 220-46.00r.

Jorpes, Johan E.: *See—*
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,723,406.

Jossa, Louis J.: *See—*
Keijzer, Johan H.; Meuleman, Francois J. G.; Jossa, Louis J.; and Stas, Jozef J., 3,722,639.

Jozuka, Masao: *See—*
Watanabe, Tomoyoshi; and Jozuka, Masao, 3,722,654.

Julie, Loebe, to Julie Research Laboratories, Inc. Circuit using dynamic high impedance load. 3,723,892, Cl. 330-35.000.

Julie Research Laboratories, Inc.: *See—*
Julie, Loebe, 3,723,892.

June, Robert, II: *See—*
Ulm, Erwin H.; and June, Robert, II, 3,722,666.

Juricek, Edward L., to Sulzer Brothers Limited. Resonance control for a muffle burner. 3,723,049, Cl. 431-183.000.

K-Tel International, Inc.: *See—*
Kieves, Garry, 3,722,746.

Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Ziemek, Gerhard; Schatz, Friedrich; and Aust, Karoly, 3,722,777.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Kitai, Kiyoshi, 3,722,391.
Kitai, Kiyoshi, 3,722,392.

Kabushiki Kaisha Kaikosha: *See—*
Hayashi, Yukio, 3,723,221.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Muraki, Kiichi; and Yoda, Tadashi, 3,722,444.

Kabushiki Kaisha Ricoh: *See—*
Mikami, Nobunao, 3,722,979.
Sone, Hitoshi, 3,723,000.

Kabushiki Kaisha Seisan Nipponsha: *See—*
Noguchi, Ryuji, 3,723,224.

Kabushiki Kaisha Tanaka Seisakusho: *See—*
Hayasaki, Hidehiko; and Hayashi, Takehiko, 3,722,818.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Hayashi, Yoshihiro, 3,722,824.
Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, 3,723,680.

Kabushiki Kaisha Toyoto Chuo Kenkyusho: *See—*
Ogasawara, Takeo; and Ishikawa, Masakazu, 3,722,634.

Kabushiki-Kaisha Tokai Rika Denki Seisakusho: *See—*
Suzuki, Masaru, 3,723,923.

Kaess, Franz; Leinhard, Klaus; and Michaud, Horst, to Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft. Process for preparing vinylidene fluoride. 3,723,549, Cl. 260-653.300.

Kahashiki Kaisha Taihei Siesakusho; a/k/a Taihei Machinery Works, Ltd.: *See—*
Oono, Hiroshi; and Tamura, Masanori, 3,723,227.

Kaimov, Gennady Petrovich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.

Kaiser Aluminum & Chemical Corporation: *See—*
Hunt, Leland F.; and Lago, Julio R., 3,723,286.

Kaiser, Carl; and Zirkle, Charles L., to Smith Kline & French Laboratories. Benzoheterocyclicalkyl derivatives of 1-phenyl-1,3,8, triazaspiro (4,5) decan-4-one. 3,723,441, Cl. 260-293.570.

Kaiser, Donald W.; and Wood, Craig K., to Olin Corporation. Process for preparing 2,4,4,4-tetrachlorobutanol. 3,723,543, Cl. 260-633.000.

Kaiser Industries Corporation: *See—*
Parlee, Norman A. D.; and Mahin, William E., 3,723,096.

Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, to Toray Industries, Inc. Process for production of carboxylic esters. 3,723,486, Cl. 260-410.90r.

Kakhniashvili, Avtandil Sememovich: *See—*

Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Kalinowski, John A.: *See—*
Stirland, Meade A.; and Kalinowski, John A., 3,723,013.

Kallander, John E. Head load balancer. 3,722,764, Cl. 224-5.00r.

Kalnin, Ilmar L., to Celanese Corporation. Surface modification of carbon fibers. 3,723,607, Cl. 423-447.000.

Kalninsh, Arvid Yanovich: *See—*
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.

Kaltenegger, Benno. Vibrating roller earth compactor. 3,722,380, Cl. 94-50.00v.

Kalua, John, Jr. Safety hook. 3,722,943, Cl. 294-82.00r.

Kamata, masamoto: *See—*
Fujii, Seiji; Uwamoto, Hiroshi; Ishida, Masayuki; and Kamata, masamoto, 3,722,244.

Kamata, Takeshi, to Ricoh Co., Ltd. Meter particularly measured quantity read-out device therefor. 3,723,711, Cl. 235-92.0ea.

Kamijo, Hirotaka: *See—*
Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, 3,723,249.

Kamp, Leonard F.; and Ewald, William P., to Eastman Kodak Company. Combined film pack and strip metering mechanism for advancing film. 3,722,385, Cl. 95-22.000.

Kan, Peter T., to BASF Wyandotte Corporation. Carbodiimide foams and improved process for preparing same. 3,723,366, Cl. 260-2.5bf.

Kanada, Eiji: *See—*
Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, 3,723,127.

Kane, William L.: *See—*
Murphy, Francis E.; and Kane, William L., 3,722,859.

Kano, Masafumi: *See—*
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo, 3,723,372.

Kansai Paint Company, Limited: *See—*
Watanabe, Tadashi; Murata, Kouichiro; Nanishi, Kiyoshi; and Yamamoto, Akira, 3,723,370.

Kantor, Ilya Solomonovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Kaplan, Martin Louis; and Kelleher, Paul Goggin, to Bell Telephone Laboratories, Incorporated. Technique for bonding antioxidants to polymer films. 3,723,405, Cl. 260-94.9gb.

Kardashian, Vahram S., to Honeywell Inc. Anisotropic thin film plated wire line sensor. 3,723,988, Cl. 340-258.00r.

Karig, Horace Edmund; and De Vries, Gerrit, to United States of America, Navy. Underwater molten salt heat storage boiler. 3,722,445, Cl. 114-16.00g.

Kasahara, Akira: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.

Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, to Institut Khimii Drevesing Akademii Nauk Latviiskoi SSR. Polymeric derivative of 1-phenylisopropylamne with carboxyformal of polyvinyl alcohol, method of producing and application thereof. 3,723,401, Cl. 260-91.3va.

Kaspar, Peter D., to International Playtex Corporation. Deposition apparatus. 3,722,467, Cl. 118-301.000.

Kasper, Werner: *See—*
Matthias, Guenther; Kasper, Werner; and Schulz, Gerhard, 3,723,509.

Kassik, Ronald W.: *See—*
Brenner, Charles H.; and Kassik, Ronald W., 3,723,738.

Kaswer, Joseph, Jr.: *See—*
Zucker, Fredric E.; Murphy, James P.; Smith, Lawrence J.; and Kaswer, Joseph, Jr., 3,723,655.

Katayama, Hajime: *See—*
Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, 3,722,994.

Katayanagi, Yoji: *See—*
Kojima, Motoki; Ochiai, Eturo; and Katayanagi, Yoji, 3,723,111.

Kato, Shigeki; and Yamamoto, Takeshi, to Asahi Glass Company, Ltd. Neutral gray glass. 3,723,142, Cl. 106-52.000.

Kato, Tetsuo; and Kusaka, Katsusi, to Daido Seiko Kabushiki Kaisha. Process for producing soft magnetic materials. 3,723,103, Cl. 75-129.000.

Katogir, Michael. Material forming apparatus. 3,722,254, Cl. 72-383.000.

Kaufman, Harry. Wire cutting plier with severed end holding means. 3,722,093, Cl. 30-124.000.

Kaul, Pradman P.; and Golding, Leonard S., to Communications Satellite Corporation. Digital differential pulse code modem. 3,723,879, Cl. 325-38.00r.

Kautz, Robert F.; and Bourgeault, Leo B., to Bendix Corporation, The. Linear frequency detector for analog to digital converter. 3,723,765, Cl. 307-233.000.

Kawabata, Norio; Indo, Masahiro; and Nishibayashi, Nobuhiko, to Matsushita Electric Industrial Co., Ltd. Gas water heater. 3,722,523, Cl. 137-94.000.

Kawabata, Yasuhiro: *See—*
Sakakibara, Naoji; Kawabata, Yasuhiro; and Tsukuba, Korehiko, 3,722,614.

Kawashima, Masao; Ohtsuki, Mikio; Fudemoto, Isao; and Tomimori, Kiyoshi, to Fujitsu Limited. Multilevel digital signal transmission system. 3,723,875, Cl. 325-13.000.

Kawashima, Toshihide: *See—*
Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, 3,723,645.

Kawashima, Yoshichi: *See—*
Okada, Masashi; Kawashima, Yoshichi; and Mitsueda, Hisami, 3,722,615.

Kay-Cee Industrial Products, Inc.: *See—*
Canepa, William P., 3,723,225.

Kayahara, Ikuta; and Tanaka, Yusuke, to Maruzen Oil Co., Ltd. Smooth surface chiller crystallizer. 3,722,229, Cl. 62-354.000.

Kaytor, James, to Olin Corporation. Engine-starting system. 3,722,209, Cl. 60-6.000.

Kazakevich, Igor Illarionovich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nikolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

Kazihara, Masao: *See—*
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.

Keahl, Gerald T.: *See—*
Sloane, Howard J.; and Keahl, Gerald T., 3,722,978.

Keeler & Dunkel, Inc.: *See—*
Enckler, Albert J., 3,722,843.

Kegler, William H.: *See—*
Poynor, Paul C.; and Kegler, William H., 3,723,086.

Keijzer, Johan H.; Meuleman, Francois J. G.; Jossa, Louis J.; and Stas, Jozef J., to Monroe Belgium N.V. Shock absorber including noise reducing means. 3,722,639, Cl. 188-315.000.

Keil, John G., to Motorola, Inc. Diffusion process for heteropitaxial germanium device fabrication utilizing polycrystalline silicon mask. 3,723,201, Cl. 148-175.000.

Kelleher, Paul Goggin: *See—*
Kaplan, Martin Louis; and Kelleher, Paul Goggin, 3,723,405.

Keller, Walter: *See—*
Loepfe, Erich; Keller, Walter; and Zweifel, Karl, 3,723,933.

Kelly, Charles R.: *See—*
Opal, Kenneth E.; Kelly, Charles R.; and Newcamp, Charles W., 3,723,840.

Kelly, Edward. Control apparatus for fuel pumps. 3,723,826, Cl. 317-135.00r.

Kelly, Wilfred J. Parking brake alarm. 3,723,968, Cl. 340-69.000.

Kemper, James M., to Monogram Industries, Inc. Combined pump and cutting apparatus. 3,722,803, Cl. 241-46.020.

Kemper, James M., to Monogram Industries, Inc. Snap action valve. 3,722,850, Cl. 251-52.000.

Kemper, Wilhelm, KG: *See—*
Kreienbaum, Hubert, 3,722,802.

Kempf, Reiner; and Riese, Hans-Walter, to Fichtel & Sachs AG. Vehicle clutch with gear synchronozing brake. 3,722,643, Cl. 192-13.00r.

Kempthorne, Richard L. Hopper dust hood. 3,722,397, Cl. 98-115.00r.

Kendall Company, The: *See—*
Newman, Nicholas S., 3,723,236.

Kendall, Trevor William, to Dictaphone Corporation. Pre-recorded magnetic tape editing device. 3,722,810, Cl. 242-56.00r.

Kenkare, Divaker B.; and Shumway, Durland K., to Colgate-Palmolive Company. Self-heating cosmetic. 3,722,752, Cl. 222-145.000.

Kennecott Copper Corporation: *See—*
Redman, Michael J., 3,723,600.
Skarbo, Roald R., 3,723,095.
Spedden, Henry Rush, 3,723,595.
Spedden, Henry Rush; Richards Kenneth J.; and Schlitt, William J., III, 3,723,598.

Kennedy, Eugene R., to American Hospital Supply Corporation. Centrifuge and self-positioning tube holder therefor. 3,722,789, Cl. 223-26.000.

Kennedy, James A., to Honeywell Information Systems, Inc., mesne. Data communication controller having dual scanning. 3,723,973, Cl. 340-172.500.

Kennedy, John H., to Bissett-Berman Corporation, The. Solid electrolyte electrolytic cell. 3,723,589, Cl. 264-101.000.

Kennedy, Thomas W.: *See—*
Fogal, Gordon L.; and Kennedy, Thomas W., 3,722,407.

Kern, Loyd R.; and Striegler, John H., to Atlantic Richfield Company. Drilling tool and bearing system. 3,722,609, Cl. 175-92.000.

Kern, William John; Bouton, Thomas Chester; and Adams, Harold Elwood, to Firestone Tire & Rubber Company, The. Method of producing graft polymers. 3,723,575, Cl. 260-879.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Boettcher, Alfred; and Nickel, Hubertus, 3,723,581.

Kershner, Osborn A., to Lambert Brake Corporation, mesne. Self-adjusting disc brake assembly. 3,722,637, Cl. 188-196.00p.

Kersten, Hilde; Meyer, Gerhard; and Neuhaus, Clemens, to Akzona Incorporated. Production of thiourea. 3,723,522, Cl. 260-552.00r.

Kesinger, Donald A.; and Inscho, Leland S., Jr., to Gates Rubber Company, The. Transplant handling means. 3,722,137, Cl. 47-34.130.

Kessler, John W. Method for fixing a fastener in two pieces of wood. 3,723,215, Cl. 156-92.000.

Kessler, Reinhard: *See—*
Carbon, Theo; and Kessler, Reinhard, 3,722,959.

Kessler, Samuel J. Prefabricated concrete structure. 3,722,159, Cl. 52-252.000.

Kettering Scientific Research, Inc.: *See—*
Treharne, Richard W.; Riley, James A.; and Thomas, Eddie R., 3,722,283.

Keznickl, Eduard: *See—*
Vockenhuber, Karl; and Keznickl, Eduard, 3,723,003.

Khattab, Ghazi, to Allied Chemical Corporation. Thermoplastic aromatic poly(ether-sulfones). 3,723,389, Cl. 260-49.000.

Khetani, Bhupendra N.; and Phillips, Eugene F., to Monsanto Company. Package for pressurized fluent materials-A. 3,722,725, Cl. 215-1.00c.

Khitro, Emmanuil Lipovich; and Zhekhov, Nikolai Nikolaevich. Thumbwheel switch with improved thumbwheel camming structure for resilient contacts. 3,723,674, Cl. 200-11.0tw.

Kidde, Walter, & Company, Inc.: *See—*
Shepherd, Denis, 3,723,340.

Kiel, Othar M., to Esso Production Research Company. Hydraulic fracturing method. 3,722,595, Cl. 166-308.000.

Kienle, Raymond P.; Bass, Gerald R.; Deegan, James J.; and Kiwiets, Johannes, to Inland Steel Company. Rotational and translational motion controlling methods and apparatus for cylindrical articles and the like. 3,722,657, Cl. 198-33.0ab.

Kieves, Garry, to K-Tel International, Inc. Cigarette container and dispenser. 3,722,746, Cl. 221-205.000.

Kilpper, Gerhard: *See—*
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, 3,723,555.

Kimberly-Clark Corporation: *See—*
Middleton, David L., 3,722,468.

Kimbrough, Clyde H. Portable deep fryer assembly. 3,722,498, Cl. 126-38.000.

Kimura, Kazu: *See—*
Tanaka, Katsunobu; Kimura, Kazu; and Yamaguchi, Ken, 3,723,248.

Kimura, Tsutomu: *See—*
Yano, Akira; and Kimura, Tsutomu, 3,723,122.

Kinetics International Corporation: *See—*
Hurst, Gerald L., 3,722,410.

King, Frank Kennedy, to Plessey Handel und Investments A.G. Infrared soldering apparatus incorporating pressure applying structure-thereto. 3,723,697, Cl. 219-85.000.

King, Harry A., to Aerojet-General Corporation. Lightweight armour material. 3,722,355, Cl. 89-36.00a.

King, Roger P.: *See—*
Ritter, George F., Jr.; and King, Roger P., 3,723,083.

Kinjo, Kikuo; Yamanouchi, Teruo; Kondo, Eiichi; and Wada, Yasuo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive materials. 3,723,116, Cl. 96-1.600.

Kinzer, Kenneth D.: *See—*
Daniels, Charles R.; and Kinzer, Kenneth D., 3,723,850.

Kirchner, Myron C., to Tubal Industries, Inc., mesne. Reinforced shadow mask for colored TV picture tubes. 3,722,043, Cl. 29-25.110.

Kirkland, Joseph J.; and Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Chromatographic packing with chemically bonded organic stationary phases. 3,722,181, Cl. 55-67.000.

Kirkwood, Creal E. Method of making expansible seal for valves. 3,723,216, Cl. 156-110.000.

Kiroku, Yoshikazu: *See—*
Igarashi, Yoshikazu; Bessho, Yoshio; Kiroku, Yoshikazu; and Takahashi, Yasuo, 3,722,440.

Kirstein, Lothar, to Schneider, Jos., & Co. Optische Werke. Pilot valve. 3,722,547, Cl. 137-625.230.

Kiselev, Valentin Makhailovich: *See—*
Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, 3,723,853.

Kishigami, Takashi: *See—*
Uchiyama, Yoshihiro; Nakano, Yoshiyuki; Kishigami, Takashi; and Arie, Ryosuke, 3,723,018.

Kisselmann, Willy; Rumpelein, Fritz; and Kope, Paul, to Agfa-Gevaert Aktiengesellschaft. Indicating instrument. 3,722,459, Cl. 116-129.00r.

Kistner, Hermann F., to Maschinenbau Oppenweiler Binder & Co. Sheet feeder. 3,722,878, Cl. 271-31.000.

Kistner, John F., to Minnesota Mining and Manufacturing Company. Amide-terminated polyether prepolymers and cured hydrophilic products thereof. 3,723,393, Cl. 260-77.50b.

Kita, Hiroshi, to New Nippon Electric Company, Ltd. Circuit for compensating for line drop between power source and load circuit. 3,723,854, Cl. 323-20.000.

Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Actuating mechanism for an electrically controlled shutter. 3,722,391, Cl. 95-53.0eb.

Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Camera shutter with novel operating mechanism. 3,722,392, Cl. 95-62.000.

Kitajima, Nobuo; Masaki, Tatsuo; and Kondo, Hideyo, to Canon Kabushiki Kaisha. Process for preparing selenium-tellurium alloys. 3,723,105, Cl. 75-134.00h.

Kitchener, Charles J.; and Rumball, Paul G., to USM Corporation. Automatic feeding mechanism for peripheral operation. 3,722,441, Cl. 112-205.000.

Kiwiets, Johannes: *See—*
Kienle, Raymond P.; Bass, Gerald R.; Deegan, James J.; and Kiwiets, Johannes, 3,722,657.

Kiyama, Masao: *See—*
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.

Klauke, Erich: *See—*
Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,723,628.

Klein, Harold T.; and West, Harold H., to Robbins Company, The. Drilling equipment with detachable transporter. 3,722,601, Cl. 173-28.000.

Klingelhoefer, William Christian; and Sansing, James Earl, Jr., to Allied Chemical Corporation. Production of phosphoric acid. 3,723,606, Cl. 423-321.000.

Klinger, Ira: *See—*
Weisman, Manuel I.; and Klinger, Ira, 3,722,100.

Klint, Joseph E., Jr. Fertilizing attachment for lawn mower. 3,722,820, Cl. 239-129.000.

Kloba, Anthony; and Maskell, Roy, to Zenith Radio Corporation. Method of detecting cathode poisoning contaminants in a cathode ray tube. 3,723,857, Cl. 324-20.0cr.

Klockner-Werke AG: *See—*
Albrecht, Werner, 3,722,846.

Klomp, Johannes, to U.S. Philips Corporation. Method of sealing a metal article to a glass article in a vacuum-tight manner. 3,722,074, Cl. 29-472.900.

Knapsack Aktiengesellschaft: *See—*
Meurer, Peter Lorenz; Dorn, Friedrich Wilhelm; and Harnisch, Heinz, 3,723,608.
Preisler, Eberhard; Harnisch, Heinz; and Mietens, Gerhard, 3,723,265.

Knell, Harvey A.; Olthoff, James A.; Scoggin, Barry A.; and Smith, Roger M., to Caterpillar Tractor Company. Epicyclic self-loading mechanism for a scraper. 3,722,114, Cl. 37-4.000.

Knierim, Henri, to Societe des Aciers Fins de l'Est. Workpiece transfer devices. 3,722,712, Cl. 214-1.0bb.

Knight, Frank W.: *See—*
Van Allen, David; and Knight, Frank W., 3,722,383.

Knight, John D.; and Darula, Andrew J., to Astrup Company, The. Self-storing awning. 3,722,571, Cl. 160-68.000.

Knight, Theodore L.; and Emery, Raymen F., to Bendix Corporation, The. Cam action tuning slides. 3,722,299, Cl. 74-10.330.

Knott, William J. Movably mounted mortar mixer. 3,722,835, Cl. 259-178.00r.

Knowles, Daniel H.; Lapinsky, George D.; Overman, Kenneth T.; and Simon, Raphael A., to Corning Glass Works. Sheet glass thickness control. 3,723,082, Cl. 65-84.000.

Knutson, Dale A.: *See—*
Clark, Raymond; and Knutson, Dale A., 3,722,367.

Kobayashi, Tatsuo; Yamashita, Maki; and Takeuchi, Hideo, to Minolta Camera Kabushiki Kaisha. Device for operation a flash circuit in an automatic flash camera. 3,722,382, Cl. 95-10.

Kobayashi, Tsuyoshi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Kobayashi, Yugoro, to Ricoh Co., Ltd. Automatic sheet-feeding device. 3,722,340, Cl. 83-203.000.

Kobe Steel, Limited: *See—*
Yamamoto, Shunji; Fujita, Tatsu; Yamaguchi, Yoshihiro; and Noguchi, Masataka, 3,722,245.

Kobelt, Jack R. Automatic holding disk brake. 3,722,636, Cl. 188-170.000.

Koch, Robert E., to General Electric Company. Oil immersible current limiting fuse assembly. 3,723,930, Cl. 337-158.000.

Koch, Ulrich H.; Matousek, Stephen; and Soderlund, Gary, to Whitye Research Tool Co. Ball valve with separable end fitting. 3,722,856, Cl. 251-152.000.

Kocks, Friedrich: *See—*
Demny, Werner, 3,722,250.

Koehler Manufacturing Company: *See—*
Lozeau, Homer A., 3,723,947.

Koehler, Waldemar: *See—*
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, 3,723,555.

Koehring Company: *See—*
Wilke, Raud A., 3,722,541.

Koeleveld, Frans P.; Ngo, Reginald Mak; and Dury, Russell G., to Dow Badische Company. Dissipation of static electricity. 3,723,811, Cl. 317-2.00r.

Koerner, Gotz: *See—*
Rossmy, Gerd; and Koerner, Gotz, 3,723,491.

Koester, Waldemar, to Maurer, Friedrich, Sohne. Method of constructing an expansion gap device and lost casing for such expansion gap. 3,722,379, Cl. 94-18.000.

Kogure, Hiroshi: *See—*
Ohama, Yasumichi; and Kogure, Hiroshi, 3,722,487.

Kohler, H. Dieter; Schnuchel, Gunther; and Scherb, Helmut, to Erdolchemie Gesellschaft mit beschrankter Haftung. Process for the removal of minute quantities of 1,3-cyclopentadiene from isoprene and/or cyclopentene. 3,723,551, Cl. 260-666.00a.

Koike, Haruki, to Nippon Gakki Seizo Kabushiki Kaisha. Ski having a hard type foamed resin core. 3,722,901, Cl. 280-11.131.

Koji, Nobuhiko: *See—*
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,251.
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,252.

Kojima, Gen; and Tabata, Yoneho, to Japan Atomic Energy Research Institute. Process for producing a copolymer of tetrafluoroethylene and propylene using radiation and a solvent. 3,723,270, Cl. 204-159.220.

Kojima, Motoki; Ochiai, Eturo; and Katayanagi, Yoji, to Konishiroku Photo Industry Co., Ltd. Method of grounding for an electronic photo-sensitive plate. 3,723,111, Cl. 96-1.00c.

Kokubo, Ryo; Yokomichi, Koji; Takakuwa, Yasuo; and Takahashi, Kozo, to Nissan Chemical Industries, Ltd. Method for reclamation of melamine waste gas. 3,723,430, Cl. 260-249.700.

Kolb, Karl Heinz: *See—*
Laurent, Henry; Wiechert, Rudolf; and Kolb, Karl Heinz, 3,723,484.

Kolbin, Nikolai Arkadievich: *See—*
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, 3,723,267.

Kolin, Alexander, to University of California, Regents of the. Orientable electromagnetic catheter probe and method. 3,722,505, Cl. 128-2.05f.

Komline, Thomas R., Sr.; and Wills, Walter R., to Komline-Sanderson Engineering Corporation. Method for agglomeration measuring and control. 3,723,712, Cl. 235-151.310.

Komline-Sanderson Engineering Corporation: *See—*
Komline, Thomas R., Sr.; and Wills, Walter R., 3,723,712.

Komoto, Taro: *See—*
Fujio, Takashi; and Komoto, Taro, 3,723,637.

Komp, Richard J.; and Weigel, John W., to Xerox Corporation. Coated corona generating electrode. 3,723,793, Cl. 313-355.000.

Kon, Alexandra: *See—*
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra, 3,723,400.

Kondo, Eiichi: *See—*
Kinjo, Kikuo; Yamanouchi, Teruo; Kondo, Eiichi; and Wada, Yasuo, 3,723,116.

Kondo, Hideyo: *See—*
Kitajima, Nobuo; Masaki, Tatsuo; and Kondo, Hideyo, 3,723,105.

Kondo, Tokiharu: *See—*
Hayashi, Jun; Ohi, Reiichi; Shishido, Tadao; and Kondo, Tokiharu, 3,723,125.

Konig, Klaus; Muller, Erwin; and Wagner, Kuno, to Bayer Aktiengesellschaft. Polyurethanes based on 2,3-dibromo-but-2-ene-1,4-diol. 3,723,392, Cl. 260-75.0np.

Koninklijke Industrielle Maatschappij Noury & Van Der Lande N.V.: *See—*
Eymans, Jacobus Johannes Antonius; Holman, Egbert Willem; and Jaspers, Hans, 3,723,336.

Koninklijke Zwavelzuurfabrieken Voorheen Ketjen N.V.: *See—*
Jacobus, Johannes; Schats, Cornelis; and Schenk, Hendrik, 3,723,355.

Konishiroku Photo Industry Co., Ltd.: *See—*
Kojima, Motoki; Ochiai, Eturo; and Katayanagi, Yoji, 3,723,111.

Konrad, Parker, to General American Transportation Corporation. Electroless alloy coatings having metallic particles dispersed therethrough. 3,723,078, Cl. 29-194.000.

Konrad, Peter: *See—*
Leduc, Joseph-Adrien; Konrad, Peter; and Troemel, Gerhard, 3,723,264.

Kope, Paul: *See—*
Kisselmann, Willy; Rumpelein, Fritz; and Kope, Paul, 3,722,459.

Kopfer, Rudolph F.; and Gaylord, John A., said Kopfer assor. to said Gaylord, John A. Means to hold dentures in place. 3,722,096, Cl. 32-3.000.

Koppers, Heinrich, G.m.b.H.: *See—*
Jakobi, Wilhelm; Kumper, Ernst; and Wagner, Hans, 3,723,054.

Koppers-Wistra-Ofenbau Gesellschaft mit beschraenkter Haftung: *See—*
Storck, Herder; and Erhard, Werner, 3,722,865.

Korpman, Ralf, to Johnson & Johnson. Pressure-sensitive adhesive tape. 3,723,170, Cl. 117-12.20p.

Kospers, Helmut: *See—*
Buchel, Karl Heinz; Grewe, Ferdinand; and Kospers, Helmut, 3,723,622.

Kostrowski, John J.: *See—*
Larkin, William A.; and Kostrowski, John J., 3,723,139.

Kosugi, Takashi; Abe, Hiroyuki; and Sudo, Hisao, to Nippon Electric Company, Limited. Circuit board panel frame construction. 3,723,822, Cl. 317-101.0dh.

Kot, Richard A.: *See—*
Hultgren, Frank A.; and Kot, Richard A., 3,723,194.

Kotuby, Paul M.: *See—*
Wakeman, Alfred W.; and Kotuby, Paul M., 3,722,748.

Kowalski, Michael: *See—*
Rakus, Julius P.; Penoyer, John A.; and Kowalski, Michael, 3,723,241.

Koyama, Tomyuki: *See—*
Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, 3,723,222.

Kozhin, Nikolai Ivanovich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nikolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

Kozlov, Stanislav Federovich, to Fizichesky Institut Imeni P.N. Lebedeva Akademii Nauk SSSR. Device with diamond detector with neutron detection. 3,723,726, Cl. 250-83.100.

Kraftwerk Union Aktiengesellschaft: *See—*
Gemein, Rudolf; and Holzer, Gerold, 3,722,965.

Krajs, Helmut; and Riese, Hans-Walter, to Fichtel & Sachs AG. Wet-type friction clutch. 3,722,647, Cl. 192-113.00b.

Kramer, Friedrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Production of pure p-xylene. 3,723,558, Cl. 260-674.00a.

Kramer, Ralph J. Method and apparatus for waste incineration. 3,722,433, Cl. 110-8.00r.

Kraus, Thaddaus, to Balzers Patent- und Beteiligungs-Aktiengesellschaft. Resistance heater test capsule construction. 3,722,259, Cl. 73-19.000.

Krause, Frans Engelbertus. Apparatus for postural treatment of humans. 3,722,507, Cl. 128-68.000.

Krause, Heinz, to Siemens Aktiengesellschaft. Separating filter network active as a quartz band-stop filter. 3,723,918, Cl. 333-72.000.

Krautzberger, Franz, to Voith, J. M., GmbH. Smoothing scraper-coating apparatus. 3,722,465, Cl. 118-123.000.

Kreienbaum, Hubert, to Kemper, Wilhelm, KG. Agricultural spreaders. 3,722,802, Cl. 239-658.000.

Kremp, Rudolf; and Hennig, Fridolin, to Agfa-Gevaert Aktiengesellschaft. Cinematographic apparatus for use with cassettes for motion picture film. 3,722,828, Cl. 242-181.000.

Kress, Edward S. Slag pot carrier. 3,722,874, Cl. 267-64.00r.

Kress, Rene F.: *See—*
Glessner, Alfred J.; Wentzheimer, William Wayne; and Kress, Rene F., 3,723,293.

Kress, Rene F., to Sun Oil Company. Hydrocracking production of lubes. 3,723,295, Cl. 208-87.000.

Kreuser, Marvin J.: *See—*
Spelha, David J.; and Kreuser, Marvin J., 3,723,735.

Krolikov, Boris Zakharovich; Krylov, Jury Petrovich; and Brod, Ilya Iosifovich. Apparatus for applying an adhesive on upper margin of a shoe upper. 3,722,466, Cl. 118-212.000.

Krout, Victor Edmund: *See—*
Rey, Ivor Allan; and Krout, Victor Edmund, 3,722,954.

Kruger, William P.; and Turner, Wilson R., to Hewlett-Packard Company. Ionization chamber for use with a mass spectrometer. 3,723,729, Cl. 250-41.9sb.

Krumme, John F.: *See—*
Busch, Paul F.; and Krumme, John F., 3,722,652.

Krupp, Roy Stephen; and Tomko, Lawrence Andrew, to Bell Telephone Laboratories, Incorporated. Electrically controllable steering arrangement for magnetic single-wall domain propagation paths. 3,723,985, Cl. 340-174.0tf.

Kruse, Paul W.; and Schmit, Joseph L., to Honeywell Inc. Process for preparing mercury cadmium telluride. 3,723,190, Cl. 148-1.500.

Krylov, Jury Petrovich: *See—*
Krolikov, Boris Zakharovich; Krylov, Jury Petrovich; and Brod, Ilya Iosifovich, 3,722,466.

Kubitzek, Alfred; and Borowski, Kurt, to Agfa-Gevaert Aktiengesellschaft. Photosensitive transducer. 3,723,934, Cl. 338-15.000.

Kubota, Eishi: *See—*
Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, 3,723,239.

Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, to Ajinomoto Co., Inc. Method of producing L-arginine by microorganism. 3,723,249, Cl. 195-47.000.

Kubota, Ryomei: *See—*
Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, 3,723,645.

Kubota, Yasuhare; and Shiono, Ryuji, to Sony Corporation. Color television camera. 3,723,639, Cl. 178-5.4st.

Kuchar, William E.: *See—*
Brolund, Theodore F.; and Kuchar, William E., 3,722,337.

Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, to Sumitomo Metal Industries, Ltd. and Ajikawa Iron Works & Construction Company Limited. Tube coating apparatus. 3,722,463, Cl. 118-6.000.

Kuester, Karl Otto: *See—*
Bergevin, Jean Paul; and Kuester, Karl Otto, 3,722,174.

Kuhle, Engelbert: *See—*

Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, 3,723,628.

Kuhn, Karl, to Societe d'Etudes de Machines Thermiques. Rotary pneumatic starter distributor for internal combustion engine. 3,722,210, Cl. 60-16.000.

Kullman, Russell M. H.: *See—*
Reinhardt, Robert M.; and Kullman, Russell M. H., 3,723,058.

Kumagai, Henry Yasuo, to Western Electric Company, Incorporated. Nitrogen-doped beta tantalum capacitor. 3,723,838, Cl. 317-258.000.

Kumper, Ernst: *See—*
Jakobi, Wilhelm; Kumper, Ernst; and Wagner, Hans, 3,723,054.

Kuraray Co., Ltd.: *See—*
Igarashi, Yoshikazu; Bessho, Yoshio; Kiroku, Yoshikazu; and Takahashi, Yasuo, 3,722,440.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Murayama, Naohiro; and Fukuda, Makoto, 3,723,754.

Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, to Mitsui Petrochemical Industries, Ltd. Process for manufacturing corrugated thermoplastic synthetic resin cardboard sheet. 3,723,222, Cl. 156-309.000.

Kurita, Yoshio: *See—*
Yamasaki, Hiroo; and Kurita, Yoshio, 3,722,273.

Kuriz, Hobart L., Jr.; Smith, Glenn H.; and Wolff, Charles H., to International Business Machines Corporation. Overdue event detector. 3,723,975, Cl. 340-172.500.

Kusaka, Katsusi: *See—*
Kato, Tetsuo; and Kusaka, Katsusi, 3,723,103.

Kush, Louis J., Jr.; and Baker, Walter L., to United States of America, Navy. Acoustical detector circuit. 3,723,951, Cl. 340-3.00r.

Kusiak, Edward H., to United Aircraft Corporation. No-back actuator system. 3,722,641, Cl. 192-8.00c.

Kwok, Michael C.: *See—*
Chatterjee, Pronoy K.; and Kwok, Michael C., 3,723,413.

Kygar, W. L.: *See—*
Russell, Carl D., 3,723,752.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Tanaka, Katsunobu; Kimura, Kazu; and Yamaguchi, Ken, 3,723,248.

Kyts, Robert B.: *See—*
Gushi, Peter James; and Kyts, Robert B., 3,722,745.

Laakmann, Peter, to Hughes Aircraft Company. Thermal imaging system. 3,723,642, Cl. 178-6.000.

Laakmann, Peter, to Hughes Aircraft Company. Phase stabilized AC power supply for reactive loads. 3,723,908, Cl. 331-177.00r.

Labana, Santokh S.: *See—*
Johnson, Olin B.; and Labana, Santokh S., 3,723,166.

Labonte, Roland J.; and Jones, Smiley H. Counting apparatus for processing machine. 3,722,335, Cl. 83-57.000.

Lace, Melvin A., to Motorola, Inc. Engine condition monitoring apparatus. 3,723,964, Cl. 340-52.00f.

Lafon, Louis, to Societe Anonyme dite: Orsymonde. 1-Naphthyl-1-hydroxy-acetamidine derivatives, their preparation and use. 3,723,527, Cl. 260-564.00r.

Lago, Julio R.: *See—*
Hunt, Leland F.; and Lago, Julio R., 3,723,286.

Lai, David Y. F.: *See—*
Borg, Richard J.; Lai, David Y. F.; Riley, Neil R.; and Wolfe, James R., 3,723,359.

Laing, Nikolaus. Cooling water pump for automobiles. 3,723,029, Cl. 417-420.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Expolotation des Procedes Georges: *See—*
Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,723,634.

Laird, Cleve W.: *See—*
Jones, Gerald M.; and Laird, Cleve W., 3,723,063.

Lakernik, Rafail Moiseevich: *See—*
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.

Lakomsky, Viktor Iosfiovich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Laliberte, Albert J.; and Richardson, Ralph A., to Omnitech Inc. Night-vision training goggles. 3,722,985, Cl. 350-311.000.

Lamb-Weston, Inc.: *See—*
Davidson, Arthur R.; Haubner, John E.; and White, George A., 3,722,401.

Lambert Brake Corporation, mesne: *See—*
Kershner, Osborn A., 3,722,637.

Lambertus, Wanmaker Willem; and Emmasingel, Johannus Godefridus, to U.S. Philips Corporation. Luminescent phosphor. 3,723,339, Cl. 252-301.60r.

Lambrecht, Ralph E.; and Najimian, Harry, Jr., to Outboard Marine Corporation. Stern drive unit propeller trimming arrangement. 3,722,456, Cl. 115-41.00r.

Landin, Uno: *See—*
Forsberg, Erik; and Landin, Uno, 3,722,165.

Lane, Constance A.: *See—*
Lutz, John T., Jr.; and Lane, Constance A., 3,723,369.

Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., to Warner-Lambert Company. Article coating method. 3,723,276, Cl. 204-192.000.

Lane, Marvin K., to United States Gypsum Company. Retarded gypsum plaster for use in long set aggregate mortar applications. 3,723,146, Cl. 106-110.000.

Laney, Barton H., to Nuclear-Chicago Corporation. Multiple sample coincidence counter. 3,723,736, Cl. 250-71.50r.

Lang, William J.; and Hentz, Donald A., to International Minerals & Chemical Corporation. Process for flocculating oil and clay-containing slimes. 3,723,310, Cl. 210-53.000.

Langauer, Theodor, to Ciba-Geigy AG. Maltese-cross scored tablet. 3,723,614, Cl. 424-15.000.

Lange, Erwin, to Bullmerwerk Karl Bullmer. Marking needle for a fabric marking machine. 3,722,328, Cl. 81-9.220.

Langford, Donald C.: *See—*
Johnson, Dale W.; Grounds, Robert B.; and Langford, Donald C., 3,723,851.

Langhein & Co.: *See—*
Ziebarth, Paul E.; and Ritter, Reinhold, 3,723,284.

Lanni, Michael J.: *See—*
Hurlburt, Charles E.; and Lanni, Michael J., 3,722,296.

Lanson Industries, Inc.: *See—*
Wikkerink, Lance A.; and Wikkerink, Lee R., 3,722,086.

Lapera, Dominic J., to Parker-Hannifin Corporation. Air boost fuel atomizing system. 3,722,218, Cl. 60-39.74r.

Lapinsky, George D.: *See—*
Knowles, Daniel H.; Lapinsky, George D.; Overman, Kenneth T.; and Simon, Raphael A., 3,723,082.

Larkin, William A.; and Kostrowski, John J., to M & T Chemicals Inc. Novel process and product. 3,723,139, Cl. 260-45.75r.

Larrain, Charles A.: *See—*
Wertz, Keith J., 3,722,742.

Larrivee, Jerry J., Jr.: *See—*
Guastella, Samuel L.; and Larrivee, Jerry J., Jr., 3,723,169.

Larson, Floyd Gotthard, Jr., to International Nickel Company, Inc., The. Production of products directly from nickel cathodes. 3,722,073, Cl. 29-472.300.

Larson, John G.; and Orange, John M., to Gulf Research & Development Company. On-stream analysis. 3,723,732, Cl. 250-43.5mr.

Larson, Roger R.: *See—*
Hein, Gary L.; and Larson, Roger R., 3,722,512.

Lash Systems, Inc.: *See—*
Goldman, Jerome L., 3,722,736.
Goldman, Jerome Lee, 3,722,449.

Last, Walter A., Jr.: *See—*
Morris, Joseph R.; and Last, Walter A., Jr., 3,722,714.

Lathrop, Francis M., III: *See—*
Van Arsdale, Lyle R.; and Lathrop, Francis M., III, 3,722,530.

Latib, Ismail Osman. Locking devices for vehicle vent windows. 3,722,935, Cl. 292-63.000.

Latrobe Steel Company: *See—*
Schlatter, Rene, 3,723,094.

Laucks, Howard H.: *See—*
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.

Laurent, Henry; Wiechert, Rudolf; and Kolb, Karl Heinz, to Schering A.G. 17-Chloro steroids. 3,723,484, Cl. 260-397.450.

Lauring, Edgar A. Folding and collapsible ladders. 3,722,622, Cl. 182-159.000.

Lavanish, Jerome M.: *See—*
Bissinger, William E.; Hardiss, Donald E.; and Lavanish, Jerome M., 3,723,538.

Law, Harold Bell, to RCA Corporation. Fabrication of focus grill type cathode ray tubes. 3,722,044, Cl. 29-25.160.

Lawrence Frederick J.: *See—*
Lawrence, Frederick J.; and Lawrence, Joseph L., 3,722,792.

Lawrence, Frederick J.; and Lawrence, Joseph L.; deceased (by Lawrence Frederick J.; executor), to Cycle Equipment Company. Tape punch. 3,722,792, Cl. 234-38.000.

Lawrence, Joseph L.: *See—*
Lawrence, Frederick J.; and Lawrence, Joseph L., 3,722,792.

Lawson, Dennis Illingworth; and O'Sullivan, Eugene Francis, to National Research Development Corporation. Fire detecting apparatus sensitive to refraction. 3,723,746, Cl. 250-218.00r.

Lazzari, Jean-Pierre; Melnick, Igar; and Vallet, Jean-Yves, to Comissariat a l'Energie Atomique and Compagnie Internationale pour l'Informatique. Integrated magnetic head having alternate conducting and insulating layers within an open loop of two magneticfilms. 3,723,665, Cl. 179-100.20c.

Leaf, Carol Ann. Exercise game. 3,722,885, Cl. 273-1.00r.

Lear Siegler, Inc.: *See—*
Surletta, Zygmunt M., 3,722,013.

Lecompte, Robert A., to National Starch and Chemical Corporation, mesne. Heat curing adhesive. 3,723,223, Cl. 156-313.000.

Lecuit, Paul; and Demilie, Paul, to Solvay & Cie. Hydromagnesite having a modified morphology and method for the preparation thereof. 3,723,596, Cl. 423-430.000.

Leduc, Joseph-Adrien; Konrad, Peter; and Troemel, Gerhard, 1/2 to Pullman Incorporated and 1/2 to Farbenfabriken Bayer Aktiengesellschaft. Electrochemical oxidation of olefinic compounds. 3,723,264, Cl. 204-80.000.

Lee, Charleston R.: *See—*

Hodge, William V.; and Lee, Charleston R., 3,723,132.
Lee, Ernest O., Jr.: *See—*
Budrys, Ignas; and Lee, Ernest O., Jr., 3,723,659.
Lee, John W.: *See—*
Michaels, Edwin B.; and Lee, John W., 3,723,540.
Lee, Kyu Tai; and Whitney, Joel G., to Du Pont de Nemours, E. I., and Company. Pharmaceutically active derivatives of ethanooctahydrophenanthrene. 3,723,504, Cl. 260-479.00r.
Lee, Lars; Gavlefors, Sture; and Eriksson, Olle, to Allmanna Svenska Elektriska Aktiebolaget. Nuclear reactor having internal pumps. 3,723,247, Cl. 156-50.000.
Lee, Raymond, Organization, Inc.: *See—*
Gagnon, Rudolph A., 3,722,091.
Lee, Raymond, Organization, Inc., The: *See—*
Fravel, Frank E., 3,722,518.
O'Dowd, Joseph, 3,722,883.
Lee, Raymond, Organization, The: *See—*
Tavo, Rene B., 3,722,016.
Lee, Roy Leon; and Aldrop, Lanneau Frazier, to Springs Mills Inc. Truck for tending textile loom batteries. 3,722,956, Cl. 298-2.000.
Leeds, Edwards: *See—*
Lumb, John B.; and Leeds, Edwards, 3,723,382.
Leeming, Peter R.: *See—*
Augstein, Joachim; Ham, Allan L.; Leeming, Peter R.; and Snarey, Michael, 3,723,524.
Leesona Corporation: *See—*
Swinehart, Robert L., 3,722,807.
Lehmkuhl, Robert A., to Carlton Machine Tool Company, The. Spindle depth control. 3,723,016, Cl. 408-3.000.
Lehnert, Bo Peter. Device for causing particles to move along curved paths. 3,722,677, Cl. 209-144.000.
Leinhard, Klaus: *See—*
Kaess, Franz; Leinhard, Klaus; and Michaud, Horst, 3,723,549.
Leisring, Herbert, to Bosch, Robert, Photokino G.m.b.H. Endless band winding apparatus. 3,722,809, Cl. 242-55.19r.
Leitz, Ernst, G.m.b.H.: *See—*
Pfohler, Wolfgang, 3,723,226.
Schlapp, Werner; and Boss, Otto, 3,722,390.
Lemberg, Seymour: *See—*
Riso, Rocco R.; and Lemberg, Seymour, 3,723,542.
Lemoine, Jacqg: *See—*
Flannery, James E.; and Lemoine, Jacqg, 3,723,144.
Leonard, Donald A., to Avco Corporation. Remote quantitative analysis of materials. 3,723,007, Cl. 356-75.000.
Leonard, Gordon Harris; Sobecki, Zygmunt; and Lomas, Peter Robert, to C.A.V. Limited. Vehicle battery charging systems. 3,723,817, Cl. 317-31.000.
Leonard, James H., to Square D Company. Electrical contact assembly. 3,723,940, Cl. 339-64.00m.
Leonard, Stephen C., to General Electric Company. Testing apparatus having improved means for measuring permeability and specific loss in a moving strip of metal. 3,723,859, Cl. 324-34.00r.
Leonardi, Samuel S. Device for raising sunken ships and other objects. 3,722,448, Cl. 114-55.000.
Leontaritis, Lambis; Schon, Nikolaus; and Hoffmann, Hans, to Farbenfabriken Bauer Aktiengesellschaft. Pretreatment of metal surfaces. 3,723,162, Cl. 117-71.00m.
Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., to Mueller Co. Tool for making service pipe coupling joint. 3,723,043, Cl. 425-393.000.
Lerner, Charlotte F., to Small World Importing Corporation. Christmas tree electric light decoration set. 3,723,723, Cl. 240-10.00t.
Lesher, Godwin F. Probe. 3,722,604, Cl. 175-19.000.
Lester, Joseph Thomas, Jr.: *See—*
Carmichael, Keith Stewart; and Lester, Joseph Thomas, Jr., 3,722,726.
Lever Brothers Company: *See—*
Cahn, Arno; Ackilli, Joseph Anthony; and Carroll, Frank Emery, 3,723,356.
Cheng, Wai Ming; Davies, James Francis; and Stuttard, Leonard Wallace, 3,723,326.
Evans, Elfed Huw, 3,723,329.
van Kampen, Daniel Marten; and Pasztor, Foscarina, nee Rozzo, 3,723,327.
Levin, Alfred A.: *See—*
Richter, Sidney B.; and Levin, Alfred A., 3,723,439.
Levin, Valentin Ilich: *See—*
Mikheev, Nikolai Borisovich; Gracheva, Maia Arkadievna; Bogomolova, Ljubov Grigorievna; and Levin, Valentin Ilich, 3,723,612.
Levine, Seymour D.; and Principe, Pacifio A., to Squibb, E. R., & Sons, Inc., mesne. 12, 17-Dioxy-and 12-oxo-17-oxy-A-norprogesterones. 3,723,508, Cl. 260-488.00b.
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich. Magnetic sensor for defects utilizing split ring coils and having means for drawing scale therefrom. 3,723,860, Cl. 324-37.000.
Lewis, Geoffrey Arthur: *See—*
Bottoms, Harry Simister; and Lewis, Geoffrey Arthur, 3,723,028.
Lewis, Harry R., to United States of America, Navy. Low heat generation turbine engine bearing. 3,722,967, Cl. 308-187.000.
Leymonerie, Paul, to U.S. Philips Corporation. Method of opening a closed vacuum vessel in a vacuum space. 3,722,069, Cl. 29-427.000.
Leyrer, Lowell J.: *See—*
Talmo, Robert Eugene; Ham, Donald L.; and Leyrer, Lowell J., 3,722,264.
Libbey-Owens-Ford Company: *See—*
Ritter, George F., Jr.; and King, Roger P., 3,723,083.
Licentia, Patent-Verwaltungs-G.m.b.H.: *See—*
Bachmeier, Alfred, 3,723,832.
Licentia Patent-Verwaltungs-G.m.b.H., mesne: *See—*
Eichhorst, Ingo, 3,723,688.
Liebert, Richard B.; and Conklin, Thomas H., to North American Philips Corporation. Method of depositing hafnium-tantalum nitride layer by reactive sputtering. 3,723,278, Cl. 204-192.000.
Lienhard, Heinz, to Ampex Corporation. High density thin film register. 3,723,983, Cl. 340-174.0mc.
Lies, Thomas Andrew; and Clapp, James Wellington, to American Cyanamid Company. Dithiocarbamate ester bactericides and fungicides. 3,723,494, Cl. 260-455.00a.
Lietzke, Alan F.: *See—*
Ehlers, Kenneth W.; Brown, Ian G.; and Lietzke, Alan F., 3,723,703.
Lifshits, Viktor Senderovich; Grigoriev, Viktor Ivanovich; Petrov, Georgy Nikolaevich; and Papkov, Oleg Sergeevich. Method of flash butt welding of articles. 3,723,701, Cl. 219-100.000.
Lignes Telegraphiques et Telephoniques: *See—*
Hamon, Bernard; and Montel, Jean-Pierre, 3,723,874.
Lilley, John W.: *See—*
Shane, Hugh J. S.; Schill, John E.; and Lilley, John W., 3,723,342.
Lim, Yen San; and Subramanian, Mahadevan, to Bell Telephone Laboratories, Incorporated. Optical tracker with variable density spatial filter. 3,723,744, Cl. 250-203.00r.
Limb, John Ormond: *See—*
Haskell, Barin Geoffry; and Limb, John Ormond, 3,723,644.
Lincoln Laboratories, Inc.: *See—*
Hein, Gary L.; and Larson, Roger R., 3,722,512.
Lindberg, Arne Robert. Method and apparatus for taking samples of liquid media. 3,722,291, Cl. 73-422.00r.
Lindenthal, Friedrich: *See—*
Bialas, Horst; and Lindenthal, Friedrich, 3,722,831.
Lintvedt, Vernon L.: *See—*
Clay, John P.; and Lintvedt, Vernon L., 3,723,231.
Liotta, Lance A. Method and device for determining the concentration of a material in a liquid. 3,723,064, Cl. 23-230.00r.
Lipchutz, Paul, to Societe d'Exploitation des Brevets Neiman. Safety lock. 3,722,242, Cl. 70-364.00a.
Liquidonics Industries, Inc.: *See—*
Sussina, Stan J., 3,722,241.
Lisiecki, Robert E., to Ex-Cell-O Corporation. Aseptic packaging machine. 3,723,060, Cl. 21-91.000.
List, Hans: *See—*
Harnoncourt, Karl; and Zeiringer, Rudolf, 3,723,280.
List, Hans. Discrete article separating and dispensing apparatus, particularly for measured counts of pills, capsules and the like. 3,722,740, Cl. 221-7.000.
Liston, Carol A.: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Liston, Daniel E.: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Liston, James H.: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Liston, Marcia: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Liston, Marcia, as trustee for: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Lit, Harry B.; and Mazzetti, Mark S., to General Electric Company. Printed circuit board guide. 3,723,823, Cl. 317-101.0dh.
Litke, Alvin C., to Allied Chemical Corporation. Mixture of phenylazophenylazonaphthyl tri(lithium sulfonate) dyestuffs. 3,723,056, Cl. 8-26.000.
Little, Harry H. Injection molding apparatus. 3,723,038, Cl. 425-192.000.
Little Warrior Co.: *See—*
Petrecz, Michael F., 3,722,788.
Litton Business Systems, Inc.: *See—*
Perez, Guillermo, 3,722,922.
Livingston, William L., to Factory Mutual Research Corporation. Fire protection system. 3,722,596, Cl. 169-1.00a.
Loepfe, Erich; Keller, Walter; and Zweifel, Karl, to Aktiengesellschaft Gebruder Loepfe. Tribo-electrical transducer for monitoring the movement of thread-like structures. 3,723,933, Cl. 338-2.000.
Loewen, Theodor. Split hub locking device. 3,723,922, Cl. 335-68.000.
Logan, John F.: *See—*
Shames, Harold; Shames, Sidney J.; and Logan, John F., 3,722,800.
Logan, Lewis J.; and Sandoval, Dante J., to Tru-Fit Products Corporation. Stud welding apparatus. 3,723,698, Cl. 219-98.000.
Logue, Leland H. Method and means for froth flotation concentration utilizing an aerator having a venturi passage. 3,722,679, Cl. 209-164.000.
Lomas, Peter Robert: *See—*
Leonard, Gordon Harris; Sobecki, Zygmunt; and Lomas, Peter Robert, 3,723,817.
Lone Star Cement Corporation: *See—*

Haldas, Walter J.; and Faust, Jesse A., 3,723,145.

Long, Ernest L.: *See—*
Frederiksen, Thomas M.; and Long, Ernest L., 3,723,830.

Long, Robert C.: *See—*
Huebner, Werner P. E.; and Long, Robert C., 3,723,658.

Long, William D.: *See—*
Fell, Ferol S.; Goering, Lowell J.; and Long, William D., 3,722,277.

Longo, Frank N.; and Durmann, George J., to Metco, Inc. Mixed metal and high-temperature plastic flame spray powder and method of flame spraying same. 3,723,165, Cl. 117-93.1pf.

Longo, Joseph F., to International Dynetics Corporation. Compacting apparatus. 3,722,403, Cl. 100-49.000.

Lonnstedt, Bo Gunnar. Auditory protection on safety helmets. 3,721,993, Cl. 2-3.00r.

Lonza Ltd.: *See—*
Barbezat, Pierre; and O'Murchu, Colm, 3,723,499.

Loomis, Clifford R., Jr.; Wiles, Jerald R.; and Newton, Russell A., to Rexham Corporation, mesne. System for handling and accumulating articles. 3,722,656, Cl. 198-19.000.

Loos, George J.: *See—*
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.

Lorain Products Corporation: *See—*
Ellis, Charles W., 3,723,888.

Los, Marinus, to American Cyanamid Company. Substituted naphthalenone and naphthalenedione compounds. 3,723,533, Cl. 260-590.000.

Louvar, James J., to Universal Oil Products Company. Process for preparing cycloalkenones. 3,723,532, Cl. 260-586.00b.

Love, Addison N., to Brown, Harold, Company. Timing valves. 3,722,851, Cl. 251-54.000.

Loveday, George Christopher, to Pye Limited. Indicating or detecting apparatus for nuclear radiation such as gamma rays. 3,723,734, Cl. 250-71.50r.

Lovrenich, Rodger T. Junction block and method of making same. 3,723,950, Cl. 339-198.00r.

Lowe, James H. C., to Airco, Inc. High strength iron-chromium-nickel alloy. 3,723,102, Cl. 75-128.00r.

Lowrance Electronics Mfg., Corporation: *See—*
Cramer, Howard A., 3,723,839.

Lowrie, Walter B. Vehicular chock. 3,722,631, Cl. 188-4.00r.

Loy, Fernand Rene, to U.S. Philips Corporation. Apparatus for remotely displaying temperature differences of an object. 3,722,282, Cl. 73-355.00r.

Lozeau, Homer A., to Koehler Manufacturing Company. Electric accessory connector for cap lamp battery. 3,723,947, Cl. 339-91.00r.

Lozhkin, Vladimir Mikhailovich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Morozov, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

LTV Altec, Inc.: *See—*
Beavers, Bobby R., 3,722,616.

Lu, Chih-Shun, to Inficon Inc. Thickness sensor for sputtering systems utilizing magnetic deflexion of electrons for thermal protection. 3,723,778, Cl. 310-8.900.

Lubin, Moshe J., to United States of America, Atomic Energy Commission. Plasma production apparatus having droplet production means and laser pre-pulse means. 3,723,246, Cl. 176-1.000.

Lucas, Howard Robert, to American Cyanamid Company. Polytetrafluoroethylene emulsion modified polyethylene terephthalate with improved processing characteristics. 3,723,373, Cl. 260-29.60f.

Lucas, Joseph, (Industries) Limited: *See—*
Allen, Brian Robert, 3,723,699.
Bottoms, Harry Simister; and Lewis, Geoffrey Arthur, 3,723,028.
Etherton, Ivor Howard, 3,723,211.
Holt, William David, 3,723,751.
Rees, Alfred, 3,723,691.
Thomas, Alan; and Heath, Ronald Alfred, 3,723,926.

Ludloff, Wolfgang, to Multiblitz, Dr. Ing. D. A. Mannesmann GmbH. Circuit arrangement for charging a storage capacitor. 3,723,849, Cl. 321-18.000.

Ludvigsen, Hans Thorkil. Tesselation or paving element. 3,722,162, Cl. 52-608.000.

Luebbe, Ray H., Jr., to Xerox Corporation. Manifold imaging method wherein the activator carries a plastic coating material. 3,723,112, Cl. 96-1.200.

Luedemann, Horst: *See—*
Goetze, Walter; Wolf, Peter; Schulz, Gerhard; and Luedemann, Horst, 3,723,530.

Lukach, Carl A.: *See—*
Craig, Alan D.; and Lukach, Carl A., 3,723,203.

Lukas, Helmut Hans, to Bell Canada-Northern Electric Research Limited. Cable sheath cutting apparatus. 3,722,092, Cl. 30-90.900.

Lukjan, Serge. Bolt and damper construction. 3,722,499, Cl. 126-292.000.

Lumb, John B.; and Leeds, Edwards, to BBA Group Limited. Friction materials. 3,723,382, Cl. 260-38.000.

Lummus, James L.; and Edwards, Carl D., to Amoco Production Company. Inert low-solids drilling fluid. 3,723,311, Cl. 252-8.50a.

Lunden, Risto: *See—*
Ebeling, Olavi; and Lunden, Risto, 3,722,532.

Lundquist, Ingemar H. Automatic card reading push button telephone system utilizing fluid pressure and technique. 3,723,664, Cl. 179-90.0cs.

Lunt, Wilbur B., to United States of America, Navy. Electrostatic contact fuze. 3,722,415, Cl. 102-70.20r.

Lunt, Wilbur B.; and Brown, Maurice H., to United States of America, Navy. Fuze function selection and firing system. 3,722,416, Cl. 102-70.20r.

Lutz, John T., Jr.; and Lane, Constance A., to Rohm & Haas Company. Vinyl halide resins plasticized with an acylated polyester of a dibasic acid and a mixture of glycols. 3,723,369, Cl. 260-22.0cb.

Luyben, William John. Concrete form clip. 3,722,849, Cl. 249-219.00r.

Luznin, Andrei Alexandrovich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.

Lynch, Francis Des.: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis Des., 3,722,887.

Lynch, John C., to McGraw-Edison Company. Auxiliary means for completing current transformer secondary winding circuit. 3,723,812, Cl. 317-14.00a.

Lynor Engineering, Inc.: *See—*
Northrup, Lyle M., 3,722,311.

Lyons, James Francis; and De Filippis, Tullio, to Control Data Corporation, mesne. Beam former. 3,723,955, Cl. 340-5.00r.

M & J Valve Company: *See—*
Van Arsdale, Lyle R.; and Lathrop, Francis M., III, 3,722,530.

M & T Chemicals Inc.: *See—*
Althouse, Harlan E.; Scott, Fremont L.; and Cole, Gordon E., Jr., 3,723,379.
Larkin, William A.; and Kostrowski, John J., 3,723,139.

Ma, James L.: *See—*
Aaland, Harold H.; and Ma, James L., 3,722,178.

Mabry, Ray W.: *See—*
Cottom, Truman W., 3,722,143.

Mac Donald, Eric; and Campbell, Frederic, to Ilford Limited. Photographic material containing filter dyes. 3,723,128, Cl. 96-84.00r.

MacDonald, John A., to Chapman Industries Inc. Knit reinforcing fabric and resin laminate. 3,723,234, Cl. 161-89.000.

MacEwen, George E., to Phillips Petroleum Company. Gable topped container and paperboard blank. 3,722,780, Cl. 229-17.00g.

MacIsaac, John T., Jr.; and Troy, James E., to Fieldcrest Mills, Inc. Tufted pile fabrics and method of making same. 3,722,442, Cl. 112-410.000.

MacKinnon, Ian Malcolm: *See—*
Hamblyn, Stephen Mark; Money, Anthony Patrick; and MacKinnon, Ian Malcolm, 3,723,290.

Maclaine, Ian A.; and Semeniw, Orest T., to Domco Industries Limited. Surface coating compositions comprising blends of vinyl chloride hompolymers. 3,723,576, Cl. 260-899.000.

Macpherson, Ian Alexander: *See—*
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, 3,723,490.

MacRander, Mas S., to GTE Automatic Electric Laboratories Incorporated. D.C. Compensated subscriber interface transformer circuit for telephone system. 3,723,662, Cl. 179-18.0hb.

Madrid, Robert W.: *See—*
Hagenbach, Robert J.; and Madrid, Robert W., 3,723,114.

Maeda, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for insuring automatic closure of an engine throttle valve upon release of the accelerator pedal. 3,722,491, Cl. 123-198.00d.

Maekawa, Jusaburo: *See—*
Sawai, Satoshi; Maekawa, Jusaburo; and Tanaka, Yoshimi, 3,723,024.

Maekawa, Tadashi; Suzuki, Akira; and Haramura, Shigenori, to Aisin Seiki Kabushiki Kaisha. Fluid power steering gear. 3,722,369, Cl. 91-380.000.

Maestrelli, Gino. Equipment for pre-filtering the solvent, particularly in dry-cleaning machines. 3,722,684, Cl. 210-167.000.

Maffitt, Kent N., to Minnesota Mining and Manufacturing Company. Beam addressable memory apparatus. 3,723,978, Cl. 340-173.0cr.

Magerlein, Helmut: *See—*
Rupp, Hans-Dieter; and Magerlein, Helmut, 3,723,604.

Magna Battery Reflector Corporation: *See—*
Schmidt, Joseph; and Heppes, Aladar, 3,723,720.

Magnien, Walter. Paint trimming device. 3,722,019, Cl. 15-114.000.

Maguire, John: *See—*
Frost, Richard H.; Maguire, John; and Sharp, Jonathan E., 3,723,036.

Mahin, William E.: *See—*
Parlee, Norman A. D.; and Mahin, William E., 3,723,096.

Mahoney, Donald T.; and Maul, John A., to Addressograph-Multigraph Corporation. Print wheel setting and control means in data recorders. 3,722,405, Cl. 101-45.000.

Maiocchi, Luigi, to Industrie Pirelli S.p.A. Lower sidewall reinforcement for a radial tire. 3,722,568, Cl. 152-374.000.

Makovetsky, Kirill Lvovich: *See—*

Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra,3,723,400.

Malcik, Frank John; Whittemore, Edward William; and Clark, John Patrick, to Swingline, Inc. Modular file element and components thereof. 3,722,701, Cl. 211-177.000.

Malen, Charles; Desnos, Monique; and Poignant, Jean-Claude, to Societe en nom Collectif "Science Union et Cie, Societe Francaise de Recherche Medicale". Tricyclic compounds. 3,723,466, Cl. 260-333.000.

Maleski, Robert Joseph: *See*—
Bachman, Gustave Bryant; and Maleski, Robert Joseph, 3,723,546.

Mallinckrodt Chemical Works: *See*—
Stevenson, John W.; and Trask, Warren T., 3,723,075.

Malloy, James J., Jr.: *See*—
Beese, Norman C.; and Malloy, James J., Jr., 3,723,783.

Mamalis, Patrick; and Outred, Dennis J., to Beecham Group Limited. Di-hydro triazine derivatives. 3,723,429, Cl. 260-249.900.

Mamontov, Boris Vasilievich: *See*—
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra,3,723,400.

Manchester, William E.; Morris, Carl M.; and Hill, John L., to Northrop Corporation. Method for forming titanium sheets. 3,722,068, Cl. 29-423.000.

Manfred, Birkholz: *See*—
Piatkowski, Paul; and Manfred, Birkholz, 3,722,302.

Mangels, Robert H.: *See*—
De Priester, Donald Jack; Horney, David C.; and Mangels, Robert H., 3,722,613.

Mann, Basil B., to Century Tool Company, Inc. Oiler spout. 3,722,762, Cl. 222-568.000.

Mann, Ralph W.; and Johnson, Frank B., to United States of America, Navy. Mine firing control apparatus. 3,722,409, Cl. 102-18.000.

Manning, Robert E.: *See*—
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,723,620.

Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, to Bayer Aktiengesellschaft. Process for the production of carbon fibers. 3,723,609, Cl. 423-447.000.

Manufacture de boites de Montres S. Graber S.A.: *See*—
Ryser, Raymond, 3,722,208.

Manufacturers Systems, Inc., mesne: *See*—
Anderson, Leroy E.; and Munn, Gerald J., 3,722,443.

Manville-Johns Corporation: *See*—
Davis, Wayne Edward, 3,723,753.

Marantette, Louis E., to General Metalcraft, Inc. Sheet metal forming apparatus. 3,722,252, Cl. 72-306.000.

Marathon Oil Company: *See*—
Poettmann, Fred H., 3,722,593.
Walker, Lynn P., 3,723,067.

Marek, Alois, to Brown, Boveri & Company, Limited. Two terminal network with negative impedance. 3,723,775, Cl. 307-304.000.

Mariani, Giuseppe: *See*—
Conta, Renato; and Mariani, Giuseppe, 3,723,694.

Marianowski, Leonard G.: *See*—
Borucka, Alina Z.; Marianowski, Leonard G.; and Baker, Bernard S., 3,723,186.

Marie, Gilbert: *See*—
Amiard, Yves; Bellissent, Jean-Paul; and Marie, Gilbert, 3,723,399.

Marine Science Industries, Inc.: *See*—
Potter, Edwin C., 3,722,678.

Markant, Henry P.: *See*—
McIlroy, Robert A.; Sage, Warnie L.; and Markant, Henry P., 3,723,068.

Markel, Arthur L.; and Wirsching, Robin F., to Reynolds Submarine Services Corporation. Apparatus for extracting oil or the like from the surface of the sea. 3,722,689, Cl. 210-242.000.

Marker, Edwin M., Jr., to Garcy Corporation. Foldable garment rack. 3,722,702, Cl. 211-178.00r.

Marker, Hannes. Toe iron for safety ski bindings. 3,722,902, Cl. 280-11.35t.

Marsh, Lawrence B., to Engineering Physics Company. Liquid height gauge. 3,722,281, Cl. 73-304.00r.

Marshall, William H. Rotative wheel covers, and the like. 3,722,958, Cl. 301-37.00n.

Marshall, William W.: *See*—
Behane, David; Spradley, Lewis Harold; Cahill, Lysle D.; and Marshall, William W., 3,723,646.

Marsicano, Matthew F.: *See*—
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.

Martel, Jacques, to Roussel-UCLAF. Process for the preparation of cyclopropane derivatives and compounds produced therein. 3,723,469, Cl. 260-343.300.

Marteny, William W., to Owens-Illinois, Inc. Apparatus and method for applying radio frequency energy to a moving web of material. 3,722,105, Cl. 34-1.000.

Martin, Elwood Allen, to Gulf & Western Industrial Products Company. Rotatable press die. 3,722,255, Cl. 72-447.000.

Martin, William R.: *See*—
Reimann, George A.; and Martin, William R., 3,723,193.

Martin-Marietta Corporation: *See*—
Miller, Edward J., 3,723,848.

Marton, Joseph; and Marton, Terezia, to Westvaco Corporation. Mottle preventing treatment for paperboard. 3,723,164, Cl. 117-76.00p.

Marton, Terezia: *See*—
Marton, Joseph; and Marton, Terezia, 3,723,164.

Martonair Limited: *See*—
Verhart, Willem Jan, 3,722,531.

Marukawa, Katsukiyo, to Sumitomo Metal Industries, Ltd. Method for static control of an oxygen blown converter. 3,723,099, Cl. 75-60.000.

Maruyama, Isami: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.

Maruyama, Isamu: *See*—
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Maruzen Oil Co., Ltd.: *See*—
Kayahara, Ikuta; and Tanaka, Yusuke, 3,722,229.

Masaki, Akira, to Hitachi, Ltd. Emitter-emitter coupled logic circuit device. 3,723,761, Cl. 307-208.000.

Masaki, Tatsuo: *See*—
Kitajima, Nobuo; Masaki, Tatsuo; and Kondo, Hideyo, 3,723,105.

Maschinenbau Oppenweiler Binder & Co.: *See*—
Kistner, Hermann F., 3,722,878.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See*—
Piatkowski, Paul; and Manfred, Birkholz, 3,722,302.

Mashimo, Yujio, to Canon,Kabushiki Kaisha. Electronic flash device. 3,723,810, Cl. 315-241.00p.

Masinda, Albert G.: *See*—
Van Hecke, George J.; and Masinda, Albert G., 3,722,329.

Maskell, Roy: *See*—
Kloba, Anthony; and Maskell, Roy, 3,723,857.

Mason, Elmer B. Multi-armature motor. 3,723,796, Cl. 310-126.000.

Massachusetts Institute of Technology: *See*—
Gilinson, Philip J., Jr.; and Dauwalter, Charles R., 3,722,262.

Massey, Roger G., to Parker and Harper Manufacturing Company, Inc., The. Between flange valve assembly and clamping member. 3,722,855, Cl. 251-151.000.

Massie, Stephen N.; and Illingworth, George E., to Universal Oil Products Company. Solvent extraction with a sultone solvent. 3,723,303, Cl. 208-325.000.

Massie, Stephen N., to Universal Oil Products Company. Stabilization of organic substances. 3,723,316, Cl. 252-50.000.

Massie, Stephen N., to Universal Oil Products Company. Oxidation of alkyl aromatic compounds. 3,723,517, Cl. 260-524.00r.

Mastropole, Alfred J.: *See*—
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.

Masuda, Kazuo: *See*—
Yokobayashi, Yasuyuki; and Masuda, Kazuo, 3,723,253.

Masuyama, Takeshi; Matsuoka, Michio; and Nishi, Tsuyoshi, to Matsushita Electric Industrial Co., Ltd. Non-linear resistors of bulk type. 3,723,175, Cl. 117-201.000.

Material Flow Inc.: *See*—
Brassington, Samuel M., 3,722,983.

Mathes, Alfred. Lubricating device for pneumatic tools. 3,722,625, Cl. 184-55.00a.

Mathews Mining Company: *See*—
Mathews, Ted C., 3,722,676.

Mathews, Ted C., to Mathews Mining Company. Ore separation. 3,722,676, Cl. 209-74.000.

Matier, William L.; and Comer, William T., to Johnson, Mead, & Company. Sulfamoyl azide composition process for lowering blood pressure. 3,723,627, Cl. 424-321.000.

Matlack, James R.: *See*—
Snyder, Larry L.; and Matlack, James R., 3,722,957.

Matousek, Stephen: *See*—
Koch, Ulrich H.; Matousek, Stephen; and Soderlund, Gary, 3,722,856.

Matsui, Takeo: *See*—
Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, 3,723,680.

Matsui, Yutaka: *See*—
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo, 3,723,372.

Matsumoto, Hiroshi, to Tokyo Kakin Kogyo Co., Ltd. Core wire material for welding of spheroidal graphite cast iron. 3,723,100, Cl. 75-123.0cb.

Matsuoka, James T.; and Cantarutti, Armindo, to Intercole Automation, Inc. Internal mixer. 3,723,039, Cl. 425-204.000.

Matsuoka, Michio: *See*—
Masuyama, Takeshi; Matsuoka, Michio; and Nishi, Tsuyoshi, 3,723,175.

Matsushita Electric Industrial Co., Ltd.: *See*—

Kawabata, Norio; Indo, Masahiro; and Nishibayashi, Nobuhiko, 3,722,523.
Masuyama, Takeshi; Matsuoka, Michio; and Nishi, Tsuyoshi, 3,723,175.
Nakashima, Akhiko; Imajima, Mituhiro; and Murase, Shigeo, 3,723,052.
Takeyama, Kojiro; and Hamamoto, Masao, 3,722,106.
Tatsuzawa, Yoshinobu, 3,723,653.
Yasumatsuya, Noboru, 3,723,804.

Matthews, Dean A., to Allis-Chalmers Corporation. Tilt cylinder anticavitation circuit. 3,722,723, Cl. 214-674.000.

Matthews, Ralph W.; and Semeniak, Nicholas W., to Allis-Chalmers Corporation. Pressure biased power take-off valve. 3,722,542, Cl. 137-596.100.

Matthews, Richard A., to Moore, Samuel, and Company. Composite tubing and method for making the same. 3,722,550, Cl. 138-137.000.

Matthias, Guenther; Kasper, Werner; and Schulz, Gerhard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of carboxylic esters. 3,723,509, Cl. 260-488.00r.

Matzner, Markus: *See*—
Chow, Sui-Wu; and Matzner, Markus, 3,723,367.

Maul, John A.: *See*—
Mahoney, Donald T.; and Maul, John A., 3,722,405.

Maulini, Maurizio; Aiuola, Franco; and Rueff, Herbert, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Rapid paper wrapping machine for soap-like articles. 3,722,175, Cl. 53-209.000.

Maurer, Friedrich, Sohne: *See*—
Koester, Waldemar, 3,722,379.

Maurer, James Irvin, to Oxy Metal Finishing Corporation, mesne. Scale reudcing agent in zinc phosphatizing compositions. 3,723,334, Cl. 252-181.000.

Maus, Fritz: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.

Max-Plancek-Gesellschaft zur Forderung der Wissenschaften e.V.: *See*—
Stocklein, Franz, 3,723,791.

Maxson, Orwin, G., to Continental Oil Company. Method for insulating and lining a borehole in permafrost. 3,722,591, Cl. 166-295.000.

Mayer, Frank, and Associates, Inc.: *See*—
Crosslen, Louis John, 3,722,699.

Mazur, Joseph N.; Ratkay, Edward J.; and Hodgson, Robert F., to Commercial Shearing & Stamping Company. Sectional control valves. 3,722,540, Cl. 137-596.000.

Mazzetti, Mark S.: *See*—
Lit, Harry B.; and Mazzetti, Mark S., 3,723,823.

Mc Cann, Farrell A., to Northrop Corporation. Charged particle beam scanning apparatus with video switching network. 3,723,800, Cl. 315-12.000.

Mc Gann, Laurence: *See*—
Osheroff, Gene W.; and Mc Gann, Laurence, 3,722,813.

McCall, Donald F., to General Motors Corporation. Hinged welding shoe. 3,723,696, Cl. 219-73.000.

McCarty, William E.: *See*—
Griswold, David E.; and McCarty, William E., 3,723,827.

McClaskey, Boyd M., to Narco Scientific Industries, Inc. Multiple oscillator isolation circuit. 3,723,899, Cl. 331-49.000.

McClure, John W., to Avco Corporation. Power absorber. 3,722,638, Cl. 188-280.000.

McConville, Thomas P., to Westgate-California Foods, Inc. Process for killing salmonella in fish meal. 3,723,136, Cl. 99-158.000.

McCord Corporation: *See*—
Tucker, Thomas M.; and Clemett, Edwin F., Jr., 3,723,683.

McCord, Robert S.; Nail, Donald H.; and Sheratte, Martin B., to McDonnell Douglas Corporation. Functional fluids of increased fire resistance. 3,723,319, Cl. 252-78.000.

McCormick, Robert J.; and Fitzgerald, Charles E., to Dow Chemical Company, The. Inset coverall lid for containers. 3,722,731, Cl. 220-60.000.

McCrickered, John T.; and Chang, Milton M. T., to Northrop Corporation. Holographic method and apparatus for checking the optical characteristics of transparent members. 3,723,010, Cl. 356-124.000.

McDermott, Richard L.; and Mueller, Scott A., to Airco, Inc., mesne. Process gas forecooling system. 3,722,226, Cl. 62-13.000.

McDonnell Douglas Corporation: *See*—
Dand, Harvey Stewart, 3,722,944.
McCord, Robert S.; Nail, Donald H.; and Sheratte, Martin B., 3,723,319.

McDonnell, Patrick: *See*—
Johns, Antony; Tiley, Michael; and McDonnell, Patrick, 3,723,268.

McDowell, John S., Jr.: *See*—
Scott, James; and McDowell, John S., Jr., 3,722,230.

McEvoy, James E.: *See*—
Alexander, Warner; and McEvoy, James E., 3,723,352.
Flank, William H.; McEvoy, James E.; and Stuart, John R., 3,723,351.

McFadden, Russell Thomson, to Dow Chemical Company, The. Purification of vinyl chloride. 3,723,550, Cl. 260-656.000.

McGain, Rodney: *See*—
Wolf, Robert L.; and McGain, Rodney, 3,722,220.

McGee, George S., Jr. Method and apparatus for dyeing textiles. 3,722,235, Cl. 68-183.000.

McGraw-Edison Company: *See*—
Beeley, Michael G.; and Thompson, Richard D., 3,722,116.
Hanson, Richard M., 3,722,115.
Lynch, John C., 3,723,812.
Rigert, Max, 3,723,686.
Urani, Angelo, 3,723,931.

McIlroy, Robert A.; Sage, Warnie L.; and Markant, Henry P., to Babcock & Wilcox Company, The. Apparatus for the preparation of sulfur dioxide. 3,723,068, Cl. 23-262.000.

McIlwain, Irwin D.: *See*—
Nolt, Edwin B.; and McIlwain, Irwin D., 3,722,934.

McKee, Arthur G., & Company: *See*—
Greaves, Melvin J., 3,722,871.

McKee Button Company: *See*—
Strouse, James L., 3,722,436.

McKenney, John D., to Royal Industries, Inc. Tire changer. 3,722,570, Cl. 157-1.280.

McKimm, Robert W.: *See*—
Sulcs, Jurist; and McKimm, Robert W., 3,723,784.

McLaughlin, Alexander; Nadeau, Herbert G.; and Rose, James S., to Upjohn Company, The. Copolymer foams containing isoryanurate, carbodiimide and either amide or imide linkages. 3,723,364, Cl. 260-2.5ac.

McLean, Michael B., to Johnson Service Company. Frequency to voltage converter. 3,723,771, Cl. 307-261.000.

McLean, Robert E.; and Farkas, Joseph J., to Rival Manufacturing Company. Can opener with removable plate which carries the cutting element thereon. 3,722,089, Cl. 30-4.00r.

McLees, Alan L.: *See*—
Butterfield, Max E.; Hoerr, Richard H.; McLees, Alan L.; and Proksch, Frederick D., 3,722,618.

McMahan, Gene P.: *See*—
Hitchcock, Robert D.; and McMahan, Gene P., 3,722,579.

McMaster, Harold A., to Guardian Industries Corporation. Apparatus for conveying glass sheets through adjacent bending and tempering stations. 3,723,085, Cl. 65-182.00a.

McMillan, Robert D., Jr., to Airco, Inc. Rolling seal spirometer. 3,722,506, Cl. 128-2.080.

McMinn, Robert E., to Black, Sivalls & Bryson, Inc. Apparatus for separating oil and gas from a foaming crude oil stream. 3,722,184, Cl. 55-174.000.

McNaney, Joseph T. Message character display apparatus. 3,723,961, Cl. 340-380.000.

McNeil Laboratories, Inc.: *See*—
Paragamian, Vasken, 3,723,459.
Plostnieks, Janis, 3,723,458.

McNerney, Frank J. Corner furring strip. 3,722,166, Cl. 52-720.000.

McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., to Rohm & Haas Company. 2-Halophenyl-4, 4-dialkyl-5-halo-5-dihalomethyl-oxazolines. 3,723,452, Cl. 260-307.00f.

McPherson, Alasdair, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Clear air turbulence detectors. 3,722,272, Cl. 73-178.00r.

McWhirt, Bobby Dwayne: *See*—
Bedwell, Thomas Albert; and McWhirt, Bobby Dwayne, 3,722,673.

Mead Corporation, The: *See*—
Behane, David; Spradley, Lewis Harold; Cahill, Lysle D.; and Marshall, William W., 3,723,646.
Wood, Prentice J., 3,722,945.

Mee, John D.; and Heseltine, Donald W., to Eastman Kodak Company. Preparation of formylmethylene compounds and corresponding photographic dyestuffs. 3,723,419, Cl. 260-240.600.

Meier, Eugen, to Aktiengesellschaft Brown, Boveri & Cie. Quench-gap assembly for lightning arresters. 3,723,821, Cl. 317-69.000.

Meier, William A.; and Wojcik, Edward P., to Signode Corporation. Fastener stack. 3,722,669, Cl. 206-56.00k.

Meier Windhorst, Christian August, to Artos Dr.-Ing. Meier-Windhorst Kommanditgesellschaft. Process and apparatus for continuously refining running lengths of materials. 3,722,233, Cl. 68-5.00d.

Melard Manufacturing Corporation: *See*—
Shames, Harold; Shames, Sidney J.; and Logan, John F. (said Logan assor. to), 3,722,800.

Mellen, Arthur J., Jr.: *See*—
Sebesta, George J.; and Mellen, Arthur J., Jr., 3,723,670.

Mellen, Edward J., Jr.: *See*—
Webb, John M., 3,722,577.

Mellors, Geoffrey W., to Union Carbide Corporation. Solid state electrolyte. 3,723,185, Cl. 136-153.000.

Melnick, Igar: *See*—
Lazzari, Jean-Pierre; Melnick, Igar; and Vallet, Jean-Yves, 3,723,665.

Melnik, Gary Alexandrovich: *See*—
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Mendoza, Phyllis E. Checking and canceling device. 3,722,997, Cl. 355-64.000.

Meraz, Daniel, Jr., to United States of America, Navy. Method of making a steel, graphite, phenolic asbestos laminate. 3,723,214, Cl. 156-87.000.

Mercier, Jacques H. Pressure vessel. 3,722,548, Cl. 138-30.000.

Merck & Co., Inc.: *See—*
Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., 3,723,496.
Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Joos, Alfred, 3,723,498.
Meridian Interprises, Inc.: *See—*
Stewart, Andrew W.; Britzman, Gilbert J.; Bauer, Dale M.; and Britzman, Bruce E., 3,722,816.
Merix Corporation: *See—*
Erickson, Alve J.; and Mix, Thomas W., 3,722,839.
Merlin Gerin, Societe Anonyone: *See—*
Payen, Jean-Pol, 3,723,672.
Merren, Thomas O.: *See—*
Banner, Aubrey E.; and Merren, Thomas O., 3,723,713.
Merrill, Charles E.; and Gifford, Joseph H. Self-propelled continuously moving toy. 3,722,134, Cl. 46-206.000.
Merrimac Industries, Inc.: *See—*
Cappucci, Joseph D., 3,723,914.
Merz & Co. Chemische Fabrik: *See—*
Scherm, Arthur; and Peteri, Dezso, 3,723,446.
Messerschmitt-Bolkow Blohm GmbH: *See—*
Zahn, Paul, 3,723,189.
Mestre, Francisco. Steering wheel locking device for vehicles. 3,722,239, Cl. 70-212.000.
Metabowerke KG Closs, Rauch & Schinizler: *See—*
Schnitzler, Albrecht, Jr., 3,723,781.
Metallgesellschaft Aktiengesellschaft: *See—*
Thumm, Wilhelm; and Nagel, Horst, 3,723,059.
Metallwerk Plansee Aktiengesellschaft: *See—*
Pohler, Alfred; and Hayek, Erich, 3,722,462.
Metco, Inc.: *See—*
Longo, Frank N.; and Durmann, George J., 3,723,165.
Metz, Thomas R.; and Holben, Eugene F., to Conoflow Corporation. Engine performance computing arrangement. 3,722,265, Cl. 73-117.300.
Meuleman, Francois J. G.: *See—*
Keijzer, Johan H.; Meuleman, Francois J. G.; Jossa, Louis J.; and Stas, Jozef J., 3,722,639.
Meurer, Peter Lorenz; Dorn, Friedrich Wilhelm; and Harnisch, Heinz, to Knapsack Aktiengesellschaft. Production of phosphorus. 3,723,608, Cl. 423-322.000.
Mevissen, Ernst A., to Dravo Corporation. Sealing device. 3,722,895, Cl. 277-34.300.
Meyer, Charles F.; Wieczorek, Robert A.; and Waters, Richard A., to Square D Company. Reed relay type permanent nor memory circuit. 3,723,767, Cl. 307-238.000.
Meyer, Gerhard: *See—*
Kersten, Hilde; Meyer, Gerhard; and Neuhaus, Clemens, 3,723,522.
Meyer, Robert E.: *See—*
Dinsdale, Vern Thomas; Redd, Russell, Jr.; and Meyer, Robert E., 3,723,206.
Meyer, Theodore H. Furniture structure. 3,722,205, Cl. 5-8.000.
Meyer, William Hasso: *See—*
Camp, Bryon; Camp, Percival Arthur; and Meyer, William Hasso, 3,722,007.
Meyerhoff, Herwig: *See—*
Gritsch, Herbert; Meyerhoff, Herwig; Bruns, Enno; and Hemmie, Gerd, 3,723,959.
Meyers, Phyllis L. Hospital scrub dress. 3,721,998, Cl. 2-74.000.
Meyers Taylor Pty. Ltd.: *See—*
Taylor, Alfred Charles, 3,722,237.
Meyerson, Stanley. Watch bracelet end connection structure. 3,722,040, Cl. 24-265.00b.
Michaels, Edwin B.; and Lee, John W. Preparation of hexachlorophene. 3,723,540, Cl. 260-619.00a.
Michalko, Edward: *See—*
Mitsche, Roy T.; and Michalko, Edward, 3,723,552.
Michaud, Horst: *See—*
Kaess, Franz; Leinhard, Klaus; and Michaud, Horst, 3,723,549.
Michaud, Jean-Francois; and Delapierre, Gilles, to Commissariat a l'Energie Atomique. Capacitive movement measuring device. 3,723,866, Cl. 324-61.00r.
Michel, Eberhard, to Siemens Aktiengesellschaft. Steam generator for pressurized water nuclear reactor. 3,722,479, Cl. 122-34.000.
Michels, Charles E., to Reliance Electric Company, mesne. Package wrapping apparatus with package actuated web severing tool. 3,722,177, Cl. 53-390.000.
Microdot, Inc.: *See—*
Munse, Robert A., 3,722,041.
Microdry Corporation, mesne: *See—*
Johnson, Ray M., 3,723,900.
Miczek, Gerhard, to Fisher-Klosterman, Inc. Gas scrubbing method and apparatus. 3,722,185, Cl. 55-238.000.
Middleton, David L., to Kimberly-Clark Corporation. Transversing mechanism for adhesive application. 3,722,468, Cl. 118-315.000.
Midland Silicones Limited: *See—*
Owen, William J.; and Cooper, Bryan E., 3,723,402.
Thompson, John; and Owen, Michael James, 3,723,566.
Miesbichler, Edgar: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.
Mietens, Gerhard: *See—*
Preisler, Eberhard; Harnisch, Heinz; and Mietens, Gerhard, 3,723,265.
Mikami, Nobunao, to Kabushiki Kaisha Ricoh. Optical system of the real image type for finders having asperic surfaces. 3,722,979, Cl. 350-54.000.
Mikheev, Nikolai Borisovich; Gracheva, Maia Arkadievna; Bogomolova, Ljubov Grigorievna; and Levin, Valentin Ilich, to Institut Biofiziki. Stabilizer for radioactive colloidal solutions. 3,723,612, Cl. 424-1.000.
Miles, Gilbert de Wayne, to Colgate-Palmolive Company. Dispensing attachment for pressurized containers. 3,722,753, Cl. 222-146.0ha.
Milke, George, to Hoesch Aktiengesellschaft. Method of and apparatus for locating leak areas of pipe lines, especially underground pipe lines. 3,722,261, Cl. 73-40.50r.
Miller, Barry S.: *See—*
Swanson, David B.; and Miller, Barry S., 3,723,174.
Miller, Charles D.: *See—*
Bushmeyer, Richard W.; and Miller, Charles D., 3,723,129.
Miller, Charles K., to Technical Communications Corporation. Voice privacy device. 3,723,878, Cl. 325-32.000.
Miller, David Christopher: *See—*
Brandle, Charles David, Jr.; and Miller, David Christopher, 3,723,599.
Miller, David M.; and Wilding, Morris D., to Swift & Company. Vegetable protein of high viscosity. 3,723,407, Cl. 260-123.500.
Miller, Edward J., to Martin-Marietta Corporation. Electrical power inverter with sinusoidal output. 3,723,848, Cl. 321-45.00r.
Miller, George A., to Rohm & Haas Company. Ethylene-bis-dithiocarbamato bis-chlorostannanes. 3,723,488, Cl. 260-429.700.
Miller, Harold L., to Vemco Products, Inc. Overhead door operator release. 3,722,141, Cl. 49-139.000.
Miller, Homer R.; and Vallone, Giacinto, to General Electric Company. Thermal protective assembly. 3,723,932, Cl. 337-405.000.
Miller, Larry. Camping furniture. 3,722,011, Cl. 5-118.000.
Miller, Matthew R.: *See—*
Nathanson, Albert; Girsky, Charles; and Miller, Matthew R., 3,722,124.
Miller, Oscar E.: *See—*
Miller, William S.; and Miller, Oscar E., 3,722,015.
Miller, Oscar Neal, to Hoffmann-La Roche Inc. Method for controlling obesity. 3,723,623, Cl. 424-266.000.
Miller, Ralph La Rue, to Bell Telephone Laboratories, Incorporated. Transmission of signals containing harmonically related signals to overcome effects of fading. 3,723,877, Cl. 325-30.000.
Miller, Richard G., to PPG Industries, Inc. Transparent metal films and wet chemical method of producing the same. 3,723,158, Cl. 117-47.00a.
Miller, Robert E.: *See—*
Brockett, Bruce W.; Miller, Robert E.; and Hinkle, Mary L., 3,723,156.
Miller, Robert E., & Co., Inc.: *See—*
Miller, Robert E., Jr.; and Balchunas, Anthony J., 3,722,565.
Miller, Robert E., Jr.; and Balchunas, Anthony J., to Miller, Robert E., & Co., Inc. Barbed T-nut. 3,722,565, Cl. 151-41.730.
Miller, W. Curtis. Portable putting game device. 3,722,889, Cl. 273-176.00f.
Miller, William S.; and Miller, Oscar E. Water board. 3,722,015, Cl. 9-310.00b.
Milliport Corporation: *See—*
Dwyer, James L.; and Reiman, Peter A., 3,722,696.
Mills, Richard G.: *See—*
Brackenbrough, Dennis D.; Godfrey, Harold E., Jr.; and Mills, Richard G., 3,723,743.
Milross, John William: *See—*
Warren, Christopher John Lewis; and Milross, John William, 3,722,758.
Mims, Paris A.; and Nettles, Larry Ronnie. Trailer hitch apparatus. 3,722,917, Cl. 280-423.00r.
Mink, Alan E.; and Mitchell, Darrell D., to Dow Corning Corporation. Stable organosilicon compositions. 3,723,567, Cl. 260-825.000.
Minneapolis Electric Steel Castings Company: *See—*
Dougall, James R., 3,722,932.
Minnesota Mining and Manufacturing Company: *See—*
Edhlund, Arthur J., 3,722,991.
Kistner, John F., 3,723,393.
Maffitt, Kent N., 3,723,978.
Robertson, Jerry E.; Harrington, Joseph Kenneth; and Banitt, Elden H., 3,722,599.
Schumacher, Gerald F., 3,723,163.
Stivers, David A., 3,723,577.
Strong, Doyle L., 3,722,406.
Thom, Karl F., 3,723,485.
Wyatt, Gerald A.; and Anderson, Gail A., 3,723,948.
Minolta Camera Kabushiki Kaisha: *See—*
Inoue, Yoshimitsu, 3,722,989.
Kobayashi, Tatsuo; Yamashita, Maki; and Takeuchi, Hideo, 3,722,382.
Nanba, Yasuhiro, 3,723,014.
Misjak, Sandra M. Ice fish saver. 3,722,940, Cl. 294-1.00r.
Miska, Aivars, to Sperry Rand Corporation. Latch and return spring. 3,722,927, Cl. 285-317.000.
Mitchell, Darrell D.: *See—*
Mink, Alan E.; and Mitchell, Darrell D., 3,723,567.
Mitchell, Kenneth E.: *See—*
Parker, Jerry W.; Scholz, John W.; and Mitchell, Kenneth E., 3,722,186.
Mitchell, Robert K.: *See—*

Johnson, Harry T.; and Mitchell, Robert K., 3,723,034.
Mitchell, Robert S., to Monsanto Company. Corrosion inhibition compositions containing substituted diamine phosphonates and processes for using the same. 3,723,347, Cl. 252-389.00a.
Mitkin, Vladimir Andreevich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.
Mitsche, Roy T.; and Michalko, Edward, to Universal Oil Products Company. Process for the isomerization of hydrocarbons. 3,723,552, Cl. 260-668.00a.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha, mesne: *See—*
Araya, Kenji; Enomoto, Akihiro; Nishina, Akira; and Yamaguchi, Masahiro, 3,722,490.
Mitsubishi Paper Mills, Inc.: *See—*
Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, 3,723,127.
Mitsueda, Hisami: *See—*
Okada, Masashi; Kawashima, Yoshichi; and Mitsueda, Hisami, 3,722,615.
Mitsui Petrochemical Industries, Ltd.: *See—*
Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, 3,723,222.
Mix, Thomas W.: *See—*
Erickson, Alve J.; and Mix, Thomas W., 3,722,839.
Miyajima, Haruo: *See—*
Torii, Tatsumi; and Miyajima, Haruo, 3,722,635.
Miyashita, Tsuneo, to Nippon Kokan Kabushiki Kaisha. Method of blowing such fluid as reducing gas into a furnace. 3,722,814, Cl. 239-1.000.
Miyatsuka, Hajime, to Fuji Photo Film Co., Ltd. Electrophotographic photosensitive zinc oxide powder mixture. 3,723,115, Cl. 96-1.800.
Mizoguchi, Kenichi: *See—*
Tanaka, Toru; Mizoguchi, Kenichi; and Nagaoka, Hiroto, 3,723,335.
Mizuho Gohan Kabushiki Kaisho: *See—*
Oono, Hiroshi; and Tamura, Masanori, 3,723,227.
Mizuno, Yukio; and Tanaka, Shigenori, to Nissan Motor Company, Limited. Method and apparatus for preparing weft yarn in a shuttleless loom. 3,722,551, Cl. 139-127.00p.
MK Research and Development Co.: *See—*
Schonfeldt, Nikolaus Augustin, 3,723,173.
Mobil Oil Corporation: *See—*
Barone, Larry F., Jr.; Patterson, Paul E.; and Shade, Ross A. (said Patterson assor. to), 3,723,987.
Bonfich, William; and Hoffman, James C., 3,723,275.
Churn, Michael C., 3,723,313.
Davis, Robert H., 3,723,314.
Tobias, Michael A.; and Strong, Jerry G., 3,723,531.
Mochida Seiyaku Kabushiki Kaisha: *See—*
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,251.
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,252.
Modern Faucet Manufacturing Company: *See—*
Rauh, Jack, 3,722,799.
Modular Wall Systems, Inc.: *See—*
Godley, Fred Darroll, 3,722,171.
Moen, Walter B.; and Halfon, Albert, to Airco, Inc. Life support process and system using solvent extraction. 3,722,179, Cl. 55-40.000.
Moericke, Dieter: *See—*
Chandre, Arthur J.; and Moericke, Dieter, 3,722,422.
Moisson-Franckhauser, Francois: *See—*
Aupoix, Marcel; and Moisson-Franckhauser, Francois, 3,723,634.
Moister, Douglas E., Jr., to Burroughs Corporation. Method for testing hermetically enclosed, electrical switching devices for leaks. 3,723,858, Cl. 324-28.0rs.
Mojden, Wallace W., to Fleetwood Systems, Inc. Indexing carousel infeed unit for can ends. 3,722,741, Cl. 221-11.000.
Molinario, Rene, to S.A. Molinario. Hair pieces. 3,722,517, Cl. 132-5.000.
Moller, Friedrich; Roegler, Manfred; Simmler, Walter; and De Montigny, Armand, to Bayer Aktiengesellschaft. Process for preparing cellular polyurethanes. 3,723,492, Cl. 260-448.80r.
Moller, Siegfried: *See—*
Oei, Han Young; and Moller, Siegfried, 3,723,192.
Molotsky, Hyman M.: *See—*
Hicks, James P.; Gramera, Robert E.; and Molotsky, Hyman M., 3,723,412.
Money, Anthony Patrick: *See—*
Hamblyn, Stephen Mark; Money, Anthony Patrick; and MacKinnon, Ian Malcolm, 3,723,290.
Monogram Industries, Inc.: *See—*
Kemper, James M., 3,722,803.
Kemper, James M., 3,722,850.
Monroe Belgium N.V.: *See—*
Keijzer, Johan H.; Meuleman, Francois J. G.; Jossa, Louis J.; and Stas, Jozef J., 3,722,639.
Monsanto Chemicals Limited: *See—*
Foster, William Rees; and Skinner, Stanley John, 3,723,586.
Monsanto Company: *See—*
Chapp, John P., 3,723,087.
Chupp, John P., 3,723,455.
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,723,381.
Dobinson, Frank, 3,723,380.
Herber, John F.; Street, Robert W.; and Richard, William R., Jr., 3,723,320.
Khetani, Bhupendra N.; and Phillips, Eugene F., 3,722,725.
Mitchell, Robert S., 3,723,347.
Ratts, Kenneth Wayne, 3,723,534.
Sears, Paul G.; and Vandersall, Howard L., 3,723,074.
Stahlheber, Norman Earl, 3,723,602.
Sullivan, James D., 3,723,315.
Montecatini Edison S.p.A.: *See—*
Daga, Giorgio Abbate; Cerrocchi, Lino; and Fracassi, Pietro, 3,723,285.
Montel, Jean-Pierre: *See—*
Hamon, Bernard; and Montel, Jean-Pierre, 3,723,874.
Montelius, Torsten, to Aktiebolaget Imo-Industri. Pumping units. 3,723,027, Cl. 417-313.000.
Moog Inc.: *See—*
Hague, Robert Z.; Hantman, Edwin F.; Laucks, Howard H.; Loos, George J.; Marsicano, Matthew F.; and Mastropole, Alfred J., 3,722,363.
Moon, Jerry W. Refuse compactor. 3,722,404, Cl. 100-52.000.
Mooney Chemicals, Inc.: *See—*
Alkaitis, Anthony; and Thomas, Gordon A., 3,723,152.
Moore, George L., to Air Reduction Company, Incorporated. 2-Methoxy-3-H-perfluorobutane as an inhalation anesthetic agent. 3,723,629, Cl. 424-342.000.
Moore, Harry: *See—*
Boose, Robert Carl; Weaver, Henry; and Moore, Harry, 3,723,693.
Moore, James R. Scavenger mechanism for two-cycle internal combustion engine. 3,722,482, Cl. 123-66.000.
Moore, Samuel, and Company: *See—*
Matthews, Richard A., 3,722,550.
Moore, Victor J., to Anglo American Corporation of South Africa Limited. Segregation apparatus. 3,722,869, Cl. 266-20.000.
Moore, Zack J., to Dow Chemical Company, The. Fog abatement with polyhydric organic compounds. 3,722,815, Cl. 239-2.00r.
Moran, John J., to Hycel, Inc. Reagent dispensing means for chemical testing apparatus. 3,723,066, Cl. 23-253.00r.
More, Philip M.: *See—*
Stevens, Walter Chandler, Jr.; and More, Philip M., 3,723,050.
Morenar S.A.: *See—*
Chiesa, Luigi, 3,722,384.
Morgan, Gerard E., to Riddell, Inc. Ski boot construction. 3,722,112, Cl. 36-2.5al.
Morgan, James K. Game call. 3,722,133, Cl. 46-178.000.
Morgan, Lee W.; and Desai, Shrikrishna N., to Johnson, S.C., & Son, Inc. Fabric treating shampoo compositions. 3,723,323, Cl. 252-90.000.
Morgan, Lee W.; and Rogers, John R., to Johnson, S. C., & Son, Inc. Fabric treating shampoo compositions. 3,723,358, Cl. 252-546.000.
Morgun, Maria Ivanovna: *See—*
Portnyagina, Vera Alexandrovna; and Morgun, Maria Ivanovna, 3,723,519.
Mori, Kazuo: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.
Morine, Richard L.; and Hokes, James J., to Fedco, Inc. Dispensing head and conveyor. 3,722,560, Cl. 141-172.000.
Moriyama, Yoshiki: *See—*
Sugimoto, Masashi; and Moriyama, Yoshiki, 3,722,858.
Moroi, Reimei: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.
Moroziv, Evgeny Vasilievich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.
Morozlmi, Eiichi: *See—*
Nagata, Yoshiaki; Higo, Yatuhiro; Hibabayashi, Satoshi; and Morozlmi, Eiichi, 3,723,153.
Morris, Carl M.: *See—*
Manchester, William E.; Morris, Carl M.; and Hill, John L., 3,722,068.
Morris, Harold D., to System-Donner Corporation. Acceleration sensing system. 3,722,293, Cl. 73-517.00r.
Morris, Joseph R.; and Last, Walter A., Jr., to Peck & Hale, Inc. Container interconnection arrangement. 3,722,714, Cl. 214-10.50r.
Morrisey, Mary F.; and Morrisey, Thomas J. Educational training device. 3,722,110, Cl. 35-30.000.
Morrisey, Thomas J.: *See—*
Morrisey, Mary F.; and Morrisey, Thomas J., 3,722,110.
Morse, Arthur L. Parametric amplifier. 3,723,755, Cl. 307-88.300.
Morsink, Lucas: *See—*

Westerhof, Pieter; and Morsink, Lucas, 3,723,482.
Mortimer, Alfred L.: *See—*
Bucaram, Salim M.; and Mortimer, Alfred L., 3,722,592.
Mortimore, William C.: *See—*
Park, John H., Jr.; and Mortimore, William C., 3,723,667.
Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr., 3,723,477.
Mose, John E., to Eastman Kodak Company. Liquid crystal apparatus for reducing contrast. 3,722,998, Cl. 335-71.000.
Moskovsky Ordent Lenina Energetichsky Institut: *See—*
Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, 3,723,853.
Moskovsky Stankostroitelny Zavood: *See—*
Itin, Artur Markovich; and Agishtein, Ernst Khaimovich, 3,722,049.
Moss, Philip Hotchkiss: *See—*
Speranza, George Phillip; and Moss, Philip Hotchkiss, 3,723,365.
Motheral, R. B. Centrifugal casting apparatus. 3,723,044, Cl. 425-435.000.
Motorola, Inc.: *See—*
Brenner, Charles H.; and Kassik, Ronald W., 3,723,738.
Cannon, James D., 3,723,910.
Davis, Earl K.; and Hansen, Kent W., 3,723,835.
Frederiksen, Thomas M.; and Long, Ernest L., 3,723,830.
Keil, John G., 3,723,201.
Lace, Melvin A., 3,723,964.
Shekerjian, Hart; and Oulman, Stanley R., 3,723,836.
Tennerstedt, M. Richard, 3,722,298.
Vondran, Daniel J., 3,722,990.
Moyle, Maurice: *See—*
Freure, Robert J.; and Moyle, Maurice, 3,723,525.
Mueller Co.: *See—*
Leopold, Wilbur R.; Hackman, Frank C.; Floren, Carl E.; and Gould, Wallace E., 3,723,043.
Mueller, Herbert: *See—*
Stuebinger, Adolf; and Mueller, Herbert, 3,723,536.
Mueller, Hubert W., Jr.: *See—*
Granberg, Mauritz; and Mueller, Hubert W., Jr., 3,723,802.
Mueller, Rolf K.; and Wolber, William G., to Bendix Corporation, The. Interrogating tire pressure indicator. 3,723,966, Cl. 340-58.000.
Mueller, Scott A.: *See—*
McDermott, Richard L.; and Mueller, Scott A., 3,722,226.
Muller, Edwin, to Siemens Aktiengesellschaft. Circuit arrangement for code checking and code transforming. 3,722,107, Cl. 34-347.0dd.
Muller, Erwin: *See—*
Konig, Klaus; Muller, Erwin; and Wagner, Kuno, 3,723,392.
Muller, Helmut; and Peterlein, Karl, to Gelsenberg Benzin Aktiengesellschaft. Process for the preparation of polybasic benzene carboxylic acids. 3,723,516, Cl. 260-524.00r.
Muller, Henrik, to Siemens Aktiengesellschaft. Process for the transmission of binary coded signals using time multiplex techniques. 3,723,657, Cl. 179-15.0bw.
Multiblitz, Dr. Ing. D. A. Mannesmann GmbH: *See—*
Ludloff, Wolfgang, 3,723,849.
Multifol Patentverwertungs AG: *See—*
Utz, Kastulus; and Antholzner, Heinrich, 3,723,168.
Mundt, Trexie I., 1/2 to O'Dell, Sterling L. Protective garment. 3,721,997, Cl. 2-46.000.
Mundy, Joseph L., to General Electric Company. Associative memory system. 3,723,979, Cl. 340-173.0am.
Munn, Gerald J.: *See—*
Anderson, Leroy E.; and Munn, Gerald J., 3,722,443.
Munse, Robert A., to Microdot, Inc. Ring clamp. 3,722,041, Cl. 24-283.000.
Muntjanoff, John R., to Caterpillar Tractor Company. Mounting arrangement for flexible members. 3,722,916, Cl. 280-421.000.
Muraki, Kiichi; and Yoda, Tadashi, to Kabushiki Kaisha Komatsu Seisakusho. Structure of under-water vehicle. 3,722,444, Cl. 114-16.00r.
Murase, Shigeo: *See—*
Nakashima, Akhiko; Imajima, Mituhiro; and Murase, Shigeo, 3,723,052.
Murata, Kouichiro: *See—*
Watanabe, Tadashi; Murata, Kouichiro; Nanishi, Kiyoshi; and Yamamoto, Akira, 3,723,370.
Murayama, Naohiro; and Fukuda, Makoto, to Kureha Kagaku Kogyo Kabushiki Kaisha. Non-thrombogenic articles. 3,723,754, Cl. 307-88.0et.
Murayama, Yukio: *See—*
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,251.
Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, 3,723,252.
Muro, Tomio: *See—*
Nakanishi, Michio; Muro, Tomio; Imamura, Hiroshi; and Yamaguchi, Nobuharu, 3,723,476.
Murphy, Francis E.; and Kane, William L., to Walworth Company. Ball valve seal for high temperature operation. 3,722,859, Cl. 251-315.000.
Murphy, James P.: *See—*
Zucker, Fredric E.; Murphy, James P.; Smith, Lawrence J.; and Kaswer, Joseph, Jr., 3,723,655.
Murphy, William J.; and Spaeder, Gerald J., to United States Steel Corporation. Age-hardening iron-base alloy with improved toughness. 3,723,196, Cl. 148-31.000.
Musgrove, Peter James, to National Research Corporation. Electrogasdynamic generators. 3,723,777, Cl. 310-5.000.
Mutt, Viktor: *See—*
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,723,406.
Myers, Charles F.; and Platter, Sandford, said Myers assor. to Jarratt, Robert L., Momories, Inc. and said Platter assor. to Semi, Inc.; Trustee in Bankruptcy for Semiconductor Electronic Momories, Inc. Heat treating process for semiconductor fabrication. ,723,053, Cl. 263-52.000.
Myers, Raymond T. Portable ground continuity tester. 3,723,863, Cl. 324-51.000.
Nadeau, Herbert G.: *See—*
McLaughlin, Alexander; Nadeau, Herbert G.; and Rose, James S., 3,723,364.
Nadorf, Benjamin, to Everlast World Boxing Headquarters Corporation. Baseball glove. 3,721,996, Cl. 2-19.000.
Nagaoka, Hiroto: *See—*
Tanaka, Toru; Mizoguchi, Kenichi; and Nagaoka, Hiroto, 3,723,335.
Nagata, Yoshiaki; Higo, Yatuhiro; Hibabayashi, Satoshi; and Morozlmi, Eiichi, to Dainippon Ink and Chemicals, Incorporated. Process for the production of a powdery coloring agent and pellets of polyalkylene resin covered therewith. 3,723,153, Cl. 117-21.00.
Nagel, Horst: *See—*
Thumm, Wilhelm; and Nagel, Horst, 3,723,059.
Nagel, Otto; Platz, Rolf; and Fuchs, Werner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of alkynols and alkynediols. 3,723,545, Cl. 260-635.00y.
Nagel-Chase Manufacturing Company, The: *See—*
Schultz, Edward H., Jr., 3,722,310.
Nagoda, Louis E.: *See—*
Spisak, Andrew J.; and Nagoda, Louis E., 3,723,794.
Nail, Donald H.: *See—*
McCord, Robert S.; Nail, Donald H.; and Sheratte, Martin B., 3,723,319.
Naito, Itsusaku: *See—*
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.
Najimian, Harry, Jr.: *See—*
Lambrecht, Ralph E.; and Najimian, Harry, Jr., 3,722,456.
Nakada, Akira, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having tone start pitch fluctuation arrangement. 3,722,344, Cl. 84-1.240.
Nakada, Yoshinao; and Thomas, David Gilbert, to Bell Telephone Laboratories, Incorporated. Spark erosion of materials. 3,723,690, Cl. 219-69.00m.
Nakagawa, Isamu: *See—*
Wada, Masamichi; Ishida, Iwao; and Nakagawa, Isamu, 3,723,354.
Nakamura, Takashi: *See—*
Yoshida, Toshiichi; Nakamura, Takashi; and Ohkubo, Kinji, 3,723,119.
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, to Yoshitomi Pharmaceutical Industries, Ltd. 3-Oxo-1-oxa-4,8-diazaspiro (4.5) decanes. 3,723,442, Cl. 260-293.660.
Nakanishi, Michio; Muro, Tomio; Imamura, Hiroshi; and Yamaguchi, Nobuharu, to Yoshitomi Pharmaceutical Industries, Ltd. 1-Hydrocarbylamino-3-(ortho-furylmethyloxyphenoxy or tetrahydrofurylmethyloxy-phenoxy)-2-propanol compounds. 3,723,476, Cl. 260-347.700.
Nakanishi, Ryoji: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.
Nakano, Yoshiyuki: *See—*
Uchiyama, Yoshihiro; Nakano, Yoshiyuki; Kishigami, Takashi; and Arie, Ryosuke, 3,723,018.
Nakashima, Akhiko; Imajima, Mituhiro; and Murase, Shigeo, to Matsushita Electric Industrial Co., Ltd. Liquid fuel burner apparatus. 3,723,052, Cl. 431-339.000.
Nakashima, Shigeo. Apparatus for automatically filling a pre-determined amount of powered grain substance. 3,722,755, Cl. 222-193.000.
Nakaya, Naohisa, to Iwatsu Electric Company, Ltd. Saw-tooth wave generators. 3,723,762, Cl. 307-228.000.
Nakazono, Fumio: *See—*
Itoh, Isamu; and Nakazono, Fumio, 3,722,863.
Nalbach, John C., to Nalbach, John R., Engineering Company, Inc. Stabilizing apparatus for lightweight containers. 3,722,663, Cl. 198-160.000.
Nalbach, John R., Engineering Company, Inc.: *See—*
Nalbach, John C., 3,722,663.
Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Photoelectric light measuring device. 3,723,014, Cl. 356-226.000.
Nanishi, Kiyoshi: *See—*
Watanabe, Tadashi; Murata, Kouichiro; Nanishi, Kiyoshi; and Yamamoto, Akira, 3,723,370.
Narayanan, Venkatachala L.: *See—*
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., 3,723,424.
Narco Scientific Industries, Inc.: *See—*
McClaskey, Boyd M., 3,723,899.

Narvesen, Bjarne; and Troen, Edvard. Arrangement in rockets. 3,722,413, Cl. 102-49.200.
Natelson, Samuel, to Rohe Scientific Corporation. Sequential centrifugal treatment of liquid samples. 3,722,790, Cl. 233-26.000.
Natens, Luc Yves; and De Gueldre, Jean Martha, to Agfa-Gevaert N.V. Magnetic flow meter. 3,722,274, Cl. 73-194.0em.
Nathanson, Albert; Girsky, Charles; and Miller, Matthew R. Target game. 3,722,124, Cl. 42-54.000.
National Bearings Company: *See—*
Bomberger, Arthur L., 3,722,968.
National Cash Register Company, The: *See—*
Brockett, Bruce W.; Miller, Robert E.; and Hinkle, Mary L., 3,723,156.
National Distillers and Chemical Corporation: *See—*
Honn, James B.; and Jacobs, Paul E., 3,722,786.
National Factors, Inc.: *See—*
Cetrulo, Frank A., Jr., 3,722,963.
National Research Corporation: *See—*
Musgrove, Peter James, 3,723,777.
National Research Development Corporation: *See—*
Lawson, Dennis Illingworth; and O'Sullivan, Eugene Francis, 3,723,746.
Young, Francis Graham; and Wilson, Christopher Guy Scott, 3,722,278.
National Starch and Chemical Corporation, mesne: *See—*
Lecompte, Robert A., 3,723,223.
Neace, Samuel C. Method of making a multi-channel magnetic head assembly. 3,722,081, Cl. 29-603.000.
Nebel, Joseph A. Nasal filters. 3,722,509, Cl. 128-140.00n.
Nelkin, Arthur; and Thompson, John H., to United States of America, Navy. Reverberation filter system. 3,723,954, Cl. 340-3.00r.
Nelson, Arthur John. Apparatus and method for drilling underwater. 3,722,584, Cl. 166-.500.
Nelson, Bobby H.; and Baugh, Benton F., to Vetco Offshore Industries, Inc. Apparatus for aligning and connecting underwater flowlines. 3,722,585, Cl. 166-.600.
Nemo Industries, Inc.: *See—*
Elsas, Norman E., 3,722,435.
Nessler, Andrei Maximilianovich: *See—*
Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler, Andrei Maximilianovich; and Vishnyak, Idal Aizikovich, 3,722,204.
Nettles, Larry Ronnie: *See—*
Mims, Paris A.; and Nettles, Larry Ronnie, 3,722,917.
Neudecker, Karl, to Agfa-Gevaert Aktiengesellschaft. Motion picture projector for use with film-containing cassettes. 3,722,988, Cl. 352-125.000.
Neuhaus, Clemens: *See—*
Kersten, Hilde; Meyer, Gerhard; and Neuhaus, Clemens, 3,723,522.
Neumann, Richard A. Fire extinguisher cabinet. 3,722,733, Cl. 220-82.00r.
Neuroth, Norbert: *See—*
Faulstich, Marga; and Neuroth, Norbert, 3,723,143.
New Nippon Electric Company, Ltd.: *See—*
Kita, Hiroshi, 3,723,854.
Newcamp, Charles W.: *See—*
Opal, Kenneth E.; Kelly, Charles R.; and Newcamp, Charles W., 3,723,840.
Newey, Herbert A.; and Holler, Howard V., to Shell Oil Company. Cyano-substituted polyepoxides. 3,723,361, Cl. 260-2.0ep.
Newman, Albert L., to Singer Company, The. Programmed color stitching mechanisms for sewing machines. 3,722,439, Cl. 112-254.000.
Newman, Nicholas S., to Kendall Company, The. Nonwoven fabrics and process therefor. 3,723,236, Cl. 161-151.000.
Newton, John M. Automatic gate. 3,722,140, Cl. 49-30.000.
Newton, Russell A.: *See—*
Loomis, Clifford R., Jr.; Wiles, Jerald R.; and Newton, Russell A., 3,722,656.
Ngo, Reginald Mak: *See—*
Koeleveld, Frans P.; Ngo, Reginald Mak; and Dury, Russell G., 3,723,811.
Nickel, Hubertus: *See—*
Boettcher, Alfred; and Nickel, Hubertus, 3,723,581.
Nickell, Robert Ernest: *See—*
Jaeger, Raymond E.; and Nickell, Robert Ernest, 3,722,821.
Nicolas, Jean Pierre, to Feller, Adolf, Aktiengesellschaft. Electronic control device with condition responsive oscillator. 3,723,901, Cl. 331-65.000.
Nicolaus, Louis Meelis: *See—*
Boogaart, Van Den; and Nicolaus, Louis Meelis, 3,723,625.
Niederprum, Hans; Voss, Peter; and Beyl, Volker, to Farbenfabriken Bayer Akitengesellschaft. Perfluoroalkyl substituted quaternary ammonium salts. 3,723,512, Cl. 260-501.150.
Nippon Electric Company, Limited: *See—*
Kosugi, Takashi; Abe, Hiroyuki; and Sudo, Hisao, 3,723,822.
Nippon Electric Glass Company, Limited: *See—*
Wada, Masamichi; Ishida, Iwao; and Nakagawa, Isamu, 3,723,354.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 3,723,633.
Koike, Haruki, 3,722,901.
Nakada, Akira, 3,722,344.
Nippon Hoso Kzokai: *See—*
Fujio, Takashi; and Komoto, Taro, 3,723,637.
Nippon Kakon Kabushiki Kaisha: *See—*
Wakabayashi, Ikuzo; and Sasaki, Tsutomu, 3,722,662.
Nippon Kayaku Kabushiki Kaisha: *See—*
Tanaka, Toru; Mizoguchi, Kenichi; and Nagaoka, Hiroto, 3,723,335.
Nippon Kogaku K.K.: *See—*
Furuta, Koichi, 3,722,386.
Nippon Kokan Kabushiki Kaisha: *See—*
Fujii, Seiji; Uwamoto, Hiroshi; Ishida, Masayuki; and Kamata, masamoto, 3,722,244.
Miyashita, Tsuneo, 3,722,814.
Nippon Piston Ring Kabushiki Kaisha: *See—*
Umezawa, Kouji, 3,723,259.
Nippondenso Co., Ltd.: *See—*
Fujii, Minoru, 3,723,809.
Okada, Masashi; Kawashima, Yoshichi; and Mitsueda, Hisami, 3,722,615.
Nishi, Tsuyoshi: *See—*
Masuyama, Takeshi; Matsuoka, Michio; and Nishi, Tsuyoshi, 3,723,175.
Nishibayashi, Nobuhiko: *See—*
Kawabata, Norio; Indo, Masahiro; and Nishibayashi, Nobuhiko, 3,722,523.
Nishida, Takeo: *See—*
Toyooka, Tadao; Nishida, Takeo; and Ichihara, Hiroshi, 3,723,187.
Nishimura, Takemi: *See—*
Sakamoto, Teruya; Nishimura, Takemi; and Takarada, Osamu, 3,722,154.
Nishina, Akira: *See—*
Araya, Kenji; Enomoto, Akihiro; Nishina, Akira; and Yamaguchi, Masahiro, 3,722,490.
Nissan Chemical Industries, Ltd.: *See—*
Kokubo, Ryo; Yokomichi, Koji; Takakuwa, Yasuo; and Takahashi, Kozo, 3,723,430.
Nissan Motor Company, Limited: *See—*
Haruna, Takashi; and Shimano, Akira, 3,723,681.
Mizuno, Yukio; and Tanaka, Shigenori, 3,722,551.
Niwa, Nobuo: *See—*
Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, 3,722,463.
Nixon, Jack M.; and Ramler, Warren J., to United States of America, Atomic Energy Commission. Deformable beam transport system with extraction port. 3,723,785, Cl. 313-63.000.
NL Industries, Inc.: *See—*
Thomas, David W., 3,723,321.
Noe, Oskar, to Fa. BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H. Roll system for tensioning elongated work pieces. 3,722,776, Cl. 226-195.000.
Noguchi, Hikoji. Alignment and packaging unit for eggs. 3,722,173, Cl. 53-62.000.
Noguchi, Masataka: *See—*
Yamamoto, Shunji; Fujita, Tatsu; Yamaguchi, Yoshihiro; and Noguchi, Masataka, 3,722,245.
Noguchi, Ryuji, to Kabushiki Kaisha Seisan Nipponsha. Apparatus for making ribbed synthetic resin boards. 3,723,224, Cl. 156-500.000.
Nolt, Edwin B.; and McIlwain, Irwin D., to Sperry Rand Corporation. Twine finger for knotter mechanism of a baler. 3,722,934, Cl. 289-13.000.
Nomura, Norio, mesne: *See—*
Sugimoto, Masashi; and Moriyama, Yoshiki, 3,722,858.
Nordgren, Robert; Jones, Duane A.; and Wittcoff, Harold A., to General Mills Chemicals, Inc. Hydroxyalkyl polygalactomannans by reaction with certain halo fatty acid compounds. 3,723,408, Cl. 260-209.00r.
Nordisk Ventilator Co., Aktieselskab: *See—*
Peill, Jurgen Eberhardt; Gerritse, Alf; Osmera, Miroslav S.; and Andersen, Christian Karmark, 3,722,396.
Nordquist, Albert W.: *See—*
Allen, Irving; George, Edward T.; and Nordquist, Albert W., 3,722,351.
Nordstrom, John D., to Ford Motor Company. Acrylate-ester-siloxane-ester-acrylate paint. 3,723,167, Cl. 117-93.310.
North America Rockwell Corporation: *See—*
Zeldman, Maurice I.; Walker, Edward J.; and Gupta, Suresh K., 3,723,737.
North American Philips Corporation: *See—*
Liebert, Richard B.; and Conklin, Thomas H., 3,723,278.
North American Rockwell Corporation: *See—*
Bisciglia, Natale R., 3,722,751.
Hamermesh, Charles L.; and Hirshfield, Stanley M., 3,723,539.
Herty, Charles H., III, 3,722,354.
Rohrberg, Roderick G.; and Harvey, Don E., 3,722,778.
Sarring, Ernest J., 3,722,336.
Sullivan, Norman F., 3,723,758.
Northern Electric Company Limited: *See—*
Bouffard, Jean; and Dionne, Yvon Onil, 3,722,770.
Schartmann, Knut Roger, 3,723,829.
Weatherup, William Paul; and Campbell, Francis Robert, 3,723,946.
Northrop Corporation: *See—*
Manchester, William E.; Morris, Carl M.; and Hill, John L., 3,722,068.
Mc Cann, Farrell A., 3,723,800.

McCrickered, John T.; and Chang, Milton M. T., 3,723,010.

Northrup, Lyle M., to Lynor Engineering, Inc. Window operator. 3,722,311, Cl. 74-425.000.

Norton Villiers Limited: *See—*
Issigonis, Alec Arnold Constantine; and Hooper, Bernard, 3,722,612.

Nosler, John C.: *See—*
Alles, Harold G.; and Nosler, John C., 3,723,652.

Novitzky, Anatol. Collapsible furniture. 3,722,952, Cl. 297-440.000.

Novo Terapeitisk Laboratorium A/S: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,723,250.

Nuclear-Chicago Corporation: *See—*
Laney, Barton H., 3,723,736.
Spelha, David J.; and Kreuser, Marvin J., 3,723,735.

Nussbaum, Frank J., to Bischoff Chemical Corporation. Method of making an electroformed mold having heat transfer conduits and foam polyurethane foundation. 3,723,584, Cl. 264-45.000.

Nussbaum, Frank J. Method of making electroformed molds. 3,723,585, Cl. 264-45.000.

Nute, Ernest B., Jr., to Armstrong Cork Company. Expansion joint for a fire-rated ceiling system. 3,722,933, Cl. 287-189.36a.

N.V. Bekaert S.A.: *See—*
Vanderfaeillie, Willy, 3,722,554.

N.V. Fabriek Van Chemische Producten Vondelingenplaat: *See—*
Boogaart, Van Den; and Nicolaus, Louis Meelis, 3,723,625.

Nya Asfalt AB: *See—*
Hornsten, Karl Herald, 3,722,610.

Nyberg, Marvin E.: *See—*
Johnston, David L.; and Nyberg, Marvin E., 3,722,879.

Nyce, Jack Leland, to Du Pont de Nemours, E. I., and Company. Preparation of curable and cured fluoropolymer products. 3,723,387, Cl. 260-47.0up.

Oakes, William George: *See—*
Greaves, Jeffrey Chester; and Oakes, William George, 3,723,403.

Oakley, Daniel C., to ESB Incorporated. Duplex electrode construction using continuous electrically nonconductive carrier strip. 3,723,181, Cl. 136-10.000.

Obermann, George, to Controls Company of America. Step-by-step drive for timer. 3,722,304, Cl. 74-112.000.

Oberst, James Francis, to Bell Telephone Laboratories, Incorporated. Phase and frequency comparator. 3,723,889, Cl. 328-134.000.

O'Brien, Lawrence H., to Hughes Aircraft Company. Traveling wave tube power supply. 3,723,798, Cl. 315-3.500.

Ocean Design Engineering Corporation: *See—*
Hunter, Raymond E., 3,723,307.

Oceanography International Corporation, mesne: *See—*
Hill, Jack O.; Fridge, David S., Jr.; and Dibble, Vaughn R., Jr., 3,722,014.

Ochiai, Eturo: *See—*
Kojima, Motoki; Ochiai, Eturo; and Katayanagi, Yoji, 3,723,111.

O'Connor, Chadwell. Instrument support structure. 3,722,847, Cl. 248-407.000.

O'Dell, Sterling L.: *See—*
Mundt, Trexie I., 3,721,997.

O'Dowd, Joseph, to Lee, Raymond, Organization, Inc., The. Child's swing. 3,722,883, Cl. 272-85.000.

Oei, Han Young; and Moller, Siegfried, to Oxy Metal Finishing Corporation, mesne. Composition and process for treating metal. 3,723,192, Cl. 148-6.170.

Office Nationale d'Etudes et de Recherches Aerospatiales: *See—*
Besson, Jean R.; and Boillot, Jean R., 3,722,258.

Ogasawara, Takeo; and Ishikawa, Masakazu, to Kabushiki Kaisha Toyoto Chuo Kenkyusho and Toyota Jidosha Kogyo Kabushiki Kaisha. Disc brake anti squeal means. 3,722,634, Cl. 188-73.500.

Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, to Mochida Seiyaku Kabushiki Kaisha. Method for extracting urokinase. 3,723,251, Cl. 195-66.00b.

Ogawa, Nobuhisa; Koji, Nobuhiko; and Murayama, Yukio, to Mochida Seiyaku Kabushiki Kaisha. Method for removing pyrogenic substances out of urokinase. 3,723,252, Cl. 195-66.00b.

Oguma, Tomio, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for controlling the pressure of a fluid fed to a clutch of a transmission. 3,722,646, Cl. 192-109.00f.

Ohama, Yasumichi; and Kogure, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for compensation of the operation of a fuel injection device for an internal combustion engine. 3,722,487, Cl. 123-140.0mp.

Ohi, Reiichi: *See—*
Hayashi, Jun; Ohi, Reiichi; Shishido, Tadao; and Kondo, Tokiharu, 3,723,125.

Ohio Nuclear, Inc.: *See—*
Blum, Alvin S., 3,722,511.

Ohkubo, Kinji: *See—*
Yoshida, Toshiichi; Nakamura, Takashi; and Ohkubo, Kinji, 3,723,119.

Ohloff, Gunther; and Schulte Elte, Karl Heinrich, to Firmenich & Cie. Monoepoxidized products of dodecatriene. 3,723,478, Cl. 260-348.00c.

Ohmura, Yoshiaki: *See—*
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, 3,723,433.

Ohnishi, Yuuji: *See—*
Hamada, Arinobu; Ohnishi, Yuuji; and Sekiguchi, Tunehisa, 3,723,209.

Ohno, Kiyotaka: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.

Ohtani, Yoshio, to Diesel Kiki Kabushiki Kaisha. Electronic governor for fuel-injection type internal combustion engines. 3,722,485, Cl. 123-102.000.

Ohtsuki, Mikio: *See—*
Kawashima, Masao; Ohtsuki, Mikio; Fudemoto, Isao; and Tomimori, Kiyoshi, 3,723,875.

Okada, Hiroaki: *See—*
Ono, Isao; Yanagihara, Tadahisa; Okada, Hiroaki; and Uotani, Takeshi, 3,723,510.

Okada, Masashi; Kawashima, Yoshichi; and Mitsueda, Hisami, to Nippondenso Co., Ltd. Vehicle door locking system. 3,722,615, Cl. 180-112.000.

Okamoto, Tadashi: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Oki Densen Kabushiki Kaisha: *See—*
Akachi, Hisateru, 3,722,203.

Okita, Akihiko: *See—*
Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, 3,722,463.

Okumura, Shinji: *See—*
Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, 3,723,249.

Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, to Moskovsky Ordent Lenina Energetichsky Institut. SCR tap changing voltage regulator. 3,723,853, Cl. 23-20.000.

Okuno, Yositosi, to Sumitomo Chemical Company, Limited. Fumigant insecticidal mixtures of d-chrysanthemates. 3,723,615, Cl. 424-18.000.

Olczewski, Edward. Picture frame. 3,722,121, Cl. 40-152.000.

Oldham, James R.: *See—*
Brown, Lloyd H.; Eftax, Daniel S. P.; Everett, George S.; and Oldham, James R., 3,723,368.

O'Leary, Timothy W.; and Hopkins, Stephen, to Compackager Corporation. Support for flexible container. 3,722,561, Cl. 141-316.000.

Olga Company: *See—*
Erteszek, Olga, 3,722,513.

Olin Corporation: *See—*
Kaiser, Donald W.; and Wood, Craig K., 3,723,543.
Kaytor, James, 3,722,209.
Parisi, Fred G., 3,722,123.
Raymond, Maurice A.; and Scardera, Michael, 3,723,341.

Oliver, Gene L., to Eastman Kodak Company. Photographic elements containing compounds derived from cyanomethyl sulfones. 3,723,154, Cl. 117-33.300.

Oliver, Roy N.: *See—*
Spain, Roy C.; and Oliver, Roy N., 3,722,240.

Olivetti, Ing., C., & C., S.p.A.: *See—*
Canarutto, Claudio, 3,723,867.
Conta, Renato; and Mariani, Giuseppe, 3,723,694.

Olmstead, Merlin E.: *See—*
Jackson, Harold W.; Olmstead, Merlin E.; and Fickenscher, William E., 3,723,714.

Olson, George E., to Caterpillar Tractor Company. Bearing supported coupling for turbochargers. 3,723,022, Cl. 415-175.000.

Olson, Laddie B. Dual wiping device for a conveyor belt in which both wipers have a common pivotal support but operate independently of each other. 3,722,667, Cl. 198-230.000.

Olson, Ralph Brent: *See—*
Esser, Harold Herman; and Olson, Ralph Brent, 3,722,227.

Olsson, Sven O., to Essar Corporation. Hydraulic pressure apparatus. 3,722,365, Cl. 91-4.00a.

Olthoff, James A.: *See—*
Knell, Harvey A.; Olthoff, James A.; Scoggin, Barry A.; and Smith, Roger M., 3,722,114.

Omnitech Inc.: *See—*
Laliberte, Albert J.; and Richardson, Ralph A., 3,722,985.

O'Murchu, Colm: *See—*
Barbezat, Pierre; and O'Murchu, Colm, 3,723,499.

Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, to Squibb, E. R., & Sons, Inc. Novel peptides having cholecystorinin activity and intermediates therefor. 3,723,406, Cl. 260-112.500.

Ono, Isao; Yanagihara, Tadahisa; Okada, Hiroaki; and Uotani, Takeshi, to Toyo Soda Manufacturing Co. Process for producing acetic esters of butenediol. 3,723,510, Cl. 260-497.00r.

Ono, Isao, to Asahi Glass Company Ltd. Process for continuously annealing a fused cast refractory body. 3,723,593, Cl. 264-332.000.

Onoda, Takiko: *See—*
Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, 3,723,249.

Oono, Hiroshi; and Tamura, Masanori, to Kahashiki Kaisha Taihei Siesakusho; a/k/a Taihei Machinery Works, Ltd. and Mizuho Gohan Kabushiki Kaisho. Apparatus for assembly of veneer sheets in plywood fabrication. 3,723,227, Cl. 156-557.000.

Opal, Kenneth E.; Kelly, Charles R.; and Newcamp, Charles W., to Power Control Corporation. Apparatus for motor current minimization. 3,723,840, Cl. 318-432.000.

Opatril, Vaclav: *See—*
Indra, Jaromir; and Opatril, Vaclav, 3,722,552.

Orange, John M.: *See—*
Larson, John G.; and Orange, John M., 3,723,732.

Orensten, Henry E.; and Orensten, Vivian C. Aquatic filtration system. 3,722,685, Cl. 210-169.000.

Orensten, Vivian C.: *See—*
Orensten, Henry E.; and Orensten, Vivian C., 3,722,685.

Osborne, Anthony: *See—*
Barrineau, Wade H.; and Osborne, Anthony, 3,722,766.

Osburn, Carl L., to Phillips Petroleum Company. Method and apparatus for controlling the flow of multiple streams. 3,722,811, Cl. 236-14.000.

Osheroff, Gene W.; and Mc Gann, Laurence, to Fluidtech Corporation. Temperature-sensitive reversing valve apparatus. 3,722,813, Cl. 236-1.00c.

Osmera, Miroslav S.: *See—*
Peill, Jurgen Eberhardt; Gerritse, Alf; Osmera, Miroslav S.; and Andersen, Christian Karmark, 3,722,396.

Ost, Joachim: *See—*
Storck, Eckhard; and Ost, Joachim, 3,723,012.

Ost, Walter; and Thomas, Klaus, to Boehringer, C. H., Sohn. N,N'-bis-[(1-formamido-2',2',2'-trichloro)-ethyl] imidazolidines. 3,723,454, Cl. 260-309.700.

Ostapchenko, George Joseph: *See—*
Hovermale, Ralph Allen; Ostapchenko, George Joseph; and Yang, Hung Han, 3,723,583.

Oster, Rudolf: *See—*
Schuster, Ludwig; and Oster, Rudolf, 3,723,541.

Ostrovskaya, Irina Yakovlevna: *See—*
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra, 3,723,400.

O'Sullivan, Eugene Francis: *See—*
Lawson, Dennis Illingworth; and O'Sullivan, Eugene Francis, 3,723,746.

Oswald, Richard Alan; and Stark, Bernard Peter, to Ciba-Geigy AG. Process for the production of epoxides containing nitrogen and sulphur. 3,723,559, Cl. 260-676.00r.

Ota, Yoshihiko: *See—*
Suzuki, Takahiro; and Ota, Yoshihiko, 3,723,643.

Otsukakoki Kabushiki Kaisha: *See—*
Asou, Setsuro; Sugawara, Junichi; Tanso, Tukuhei; and Yashiro, Katsuji, 3,722,318.

Otsuki, Tetsuo: *See—*
Iwano, Haruhiko; Tanaka, Mitsugu; Otsuki, Tetsuo; and Arai, Atsuaki, 3,723,118.

Ott, Hans, to Sandoz-Wander, Inc. 1-Substituted-4-aryl-2(1H)-quinazolinones and their preparation. 3,723,432, Cl. 260-251.0qb.

Oulman, Stanley R.: *See—*
Shekerjian, Hart; and Oulman, Stanley R., 3,723,836.

Outboard Marine Corporation: *See—*
Carpenter, Eugene C., 3,722,455.
Cavil, David T., 3,723,844.
Lambrecht, Ralph E.; and Najimian, Harry, Jr., 3,722,456.

Outred, Dennis J.: *See—*
Mamalis, Patrick; and Outred, Dennis J., 3,723,429.

Outtrup, Helle: *See—*
Aunstrup, Knud; Andresen, Otto; and Outtrup, Helle, 3,723,250.

Overby, Howard. Pneumatic valve closing mechanism. 3,722,483, Cl. 123-90.140.

Overholt, Anne E.: *See—*
Russell, Carl D., 3,723,752.

Overholt, Harvey C.: *See—*
Russell, Carl D., 3,723,752.

Overman, Kenneth T.: *See—*
Knowles, Daniel H.; Lapinsky, George D.; Overman, Kenneth T.; and Simon, Raphael A., 3,723,082.

Owatonna Manufacturing Company, Inc.: *See—*
Fisher, Ivan E., 3,722,190.

Owen, Michael James: *See—*
Thompson, John; and Owen, Michael James, 3,723,566.

Owen, William J.; and Cooper, Bryan E., to Midland Silicones Limited. Composition comprising polypropylene and an organosilicon compound. 3,723,402, Cl. 260-93.700.

Owens-Illinois, Inc.: *See—*
Colchagoff, Robert D., 3,723,084.
Marteny, William W., 3,722,105.
Schaufele, Robert F., 3,723,977.

Oxenham, John Kenneth, to U.S. Philips Corporation. Measuring the beam landing characteristic of a shadow-mask cathode-ray tube. 3,723,801, Cl. 315-13.0cc.

Oxford Pendaflex Corporation: *See—*
Chitester, John Alvin; and Jonas, Frank D., 3,722,964.

Oxy Metal Finishing Corporation: *See—*
Tupper, George L., 3,723,148.

Oxy Metal Finishing Corporation, mesne: *See—*
Maurer, James Irvin, 3,723,334.
Oei, Han Young; and Moller, Siegfried, 3,723,192.

Oxy-Catalyst Inc.: *See—*
Houdry, Jacques H., 3,723,070.

Oyamada, Masahiro: *See—*
Tsuda, Hisashi; and Oyamada, Masahiro, 3,722,253.

P & B Agencies (Proprietary) Limited: *See—*
Hayes, Arthur William, 3,722,377.

Pacific Press & Shear Corporation: *See—*
Richardson, Rolland A., 3,722,366.

Packard Instrument Company, Inc.: *See—*
Frank, Edmund, 3,722,719.

Page, William H.; and Spillson, George A., to Consolidated Packaging Corporation. Foldable carry-out serving tray. 3,722,781, Cl. 229-28.000.

Paige, Janet N.: *See—*
Tomalia, Donald A.; and Paige, Janet N., 3,723,451.

Palman, Leonard. Windscreen filters. 3,722,949, Cl. 296-97.00c.

Paltier Corporation, The: *See—*
Skubic, Leroy F., 3,722,928.

Pammer, Gottfried: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.

Pampus, Gottfried: *See—*
Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, 3,723,609.

Panico, Joseph J., to Health Systems, Inc. Discharge flash tube high energy switch. 3,723,887, Cl. 328-76.000.

Panzarino, Joseph N.: *See—*
Howell, Robert G.; and Panzarino, Joseph N., 3,723,080.

Paoli, Thomas Lee; and Ripper, Jose Ellis, to Bell Telephone Laboratories, Incorporated. Dynamic FM control of the transverse modes of a self-pulsing semiconductor laser. 3,723,903, Cl. 331-94.50m.

Papkov, Oleg Sergeevich: *See—*
Lifshits, Viktor Senderovich; Grigoriev, Viktor Ivanovich; Petrov, Georgy Nikolaevich; and Papkov, Oleg Sergeevich, 3,723,701.

Paragamian, Vasken, to McNeil Laboratories, Inc. 2-Oxospiro (indoline -3,4'-thiochroman) derivatives. 3,723,459, Cl. 260-325.000.

Pardun, Richard L.: *See—*
Besuner, Sidney; and Pardun, Richard L., 3,722,502.

Parekh, Girish Girdhar; and Blank, Werner Josef, to American Cyanamid Company. Thermoset organic compositions containing trisulfonylmethanes. 3,723,374, Cl. 260-29.4ua.

Parente, Robert B.: *See—*
Jaffe, Richard M.; and Parente, Robert B., 3,723,718.

Parish, Harlie A., Jr.: *See—*
Reynolds, Martin Lance; Hammersmith, James R.; and Parish, Harlie A., Jr., 3,722,515.

Parisi, Fred G., to Olin Corporation. Caseless ammunition firing system. 3,722,123, Cl. 42-16.000.

Park, John H., Jr.; and Mortimore, William C., to PKM Corporation. Apparatus for speech compression. 3,723,667, Cl. 179-100.1vc.

Parker and Harper Manufacturing Company, Inc., The: *See—*
Massey, Roger G., 3,722,855.

Parker, Evelyn B.: *See—*
Russell, Carl D., 3,723,752.

Parker, Frederick A., to Biomarine Industries. Safety apparatus for oxygen supply system. 3,722,510, Cl. 128-142.000.

Parker, Jerry W.; Scholz, John W.; and Mitchell, Kenneth E., to Uni Filter, Inc. Air filter construction. 3,722,186, Cl. 55-304.000.

Parker, Norman E.; and Siravo, Ernest D. Auxiliary chipper chute. 3,722,648, Cl. 193-1.000.

Parker, R. A.: *See—*
Russell, Carl D., 3,723,752.

Parker-Hannifin Corporation: *See—*
Grahl, Darwin R., 3,722,923.
Lapera, Dominic J., 3,722,218.

Parlee, Norman A. D.; and Mahin, William E., to Kaiser Industries Corporation. Production of metals from metalliferous materials. 3,723,096, Cl. 75-21.000.

Parola, Gary D., to Grove Valve and Regulator Company. Valve with perforated ribbon silencing element. 3,722,854, Cl. 251-127.000.

Parran, John J., Jr., to Procter & Gamble Company, The. Detergent compositions containing particle deposition enhancing agents. 3,723,325, Cl. 252-106.000.

Parry, Philip James: *See—*
Twigg, Peter Lindsay; and Parry, Philip James, 3,723,108.

Pascale, John V.: *See—*
Brodnitz, Michael H.; and Pascale, John V., 3,723,135.

Pashak, John F., to Dow Chemical Company, The. Extruded consumable anodes with anodized core-cladding interface. 3,723,282, Cl. 204-197.000.

Pass, Arthur D. Abrading device to clean surfaces. 3,722,150, Cl. 51-391.000.

Passarelli, William O., Jr., to Sperry Rand Corporation. Multiple rotation gyroscope with hydrodynamic suspension. 3,722,295, Cl. 74-5.000.

Passoni, Teresio, to Innocenti Societa Generale per l'Industria Mettallurgica & Meccanica. Hot perforating mill. 3,722,246, Cl. 72-97.000.

Pasztor, Foscarina, nee Rozzo: *See—*
van Kampen, Daniel Marten; and Pasztor, Foscarina, nee Rozzo, 3,723,327.

Patel, Chandra K. N., to Bell Telephone Laboratories, Incorporated. Carbon dioxide laser employing multiple gases including oxygen and water vapor. 3,723,902, Cl. 331-94.50g.

Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich. Method for the plasma-arc remelting of a consumable metal bar in a controlled atmosphere. 3,723,630, Cl. 13-1.000.

Patrick, Harris W. Exercycle with interacting waist belt. 3,722,882, Cl. 272-73.000.

Patterson, Paul E.: *See—*
Barone, Larry F., Jr.; Patterson, Paul E.; and Shade, Ross A., 3,723,987.

Paul, Frederick W., to Crompton & Knowles Corporation. Strand monitor. 3,723,990, Cl. 340-259.000.

Payen, Jean-Pol, to Merlin Gerin, Societe Anonyone. Electrical distribution and current collecting system for a high speed vehicle. 3,723,672, Cl. 191-50.000.

Payne, Harry R., to Cavalier Corporation. Split vend gate mechanism. 3,722,744, Cl. 221-129.000.

Pearson, Archie A.: *See—*
Bogart, Harold N.; Hopwood, Norman W., Jr.; Pearson, Archie A.; and Whitacre, Foster E., 3,722,257.

Pearson, Samuel Reader, to Texas Instruments, Incorporated. Electrical braking for a D.C. servo motor control circuit. 3,723,843, Cl. 318-612.000.

Pechiney-Saint-Gobain: *See—*
Correia, Yves, 3,723,331.

Peck & Hale, Inc.: *See—*
Morris, Joseph R.; and Last, Walter A., Jr., 3,722,714.

Pecott, Clyde E., to Safe Key Lock Company. Combination controlled actuating device. 3,723,682, Cl. 200-61.640.

Pedersen, Arne R., to Zenith Radio Corporation. UHF oscillator. 3,723,906, Cl. 331-117.00d.

Pedrazzoli, Andrea: *See—*
Gradnik, Boris; Pedrazzoli, Andrea; and Dall'Asta, Leone, 3,723,453.

Peil, William, to General Electric Company. Amplifier of controllable gain. 3,723,895, Cl. 330-29.000.

Peill, Jurgen Eberhardt; Gerritse, Alf; Osmera, Miroslav S.; and Andersen, Christian Karmark, to Nordisk Ventilator Co., Aktieselskab. System for the ventilation of buildings. 3,722,396, Cl. 98-33.00r.

Peillex, Pau, to Arisara Investment Corporation NV. Transparent protective screen. 3,721,995, Cl. 2-10.000.

Pelizza, Carlo. Liquid detergent compositions. 3,723,328, Cl. 252-111.000.

Pelosi, Stanford S., Jr., to Morton-Norwich Products, Inc. 4-Fluoro-3-methylphenyl 5-nitro-2-furyl ketone. 3,723,477, Cl. 260-347.800.

Pelton, Norman R. Containerized tree seedling units and method of making these units. 3,722,139, Cl. 47-58.000.

Penoyer, John A.: *See—*
Rakus, Julius P.; Penoyer, John A.; and Kowalski, Michael, 3,723,241.

Perez, Guillermo, to Litton Business Systems, Inc. Poster board for accounting forms. 3,722,922, Cl. 282-29.00b.

Perez-Alberne, Evelio A., to Eastman Kodak Company. Synthesis of chalcogenated polyacenes. 3,723,417, Cl. 260-239.00r.

Perkins, Richard W.: *See—*
Wogman, Ned A.; Perkins, Richard W.; Rieck, Henry G.; and Cooper, John A., 3,723,727.

Perreault, Donald A., to Xerox Corporation. Method and apparatus for rapidly scanning a document. 3,723,640, Cl. 178-6.000.

Perron, James S.: *See—*
Anderson, John R.; and Perron, James S., 3,722,574.

Persinos, Georgia J., to Amazon Natural Drug Company. Method of producing stevioside. 3,723,410, Cl. 260-210.00r.

Personal Products Company: *See—*
Chatterjee, Pronoy K.; and Kwok, Michael C., 3,723,413.

Pervolarakis, Themis. Anti-holdup device for counters. 3,722,432, Cl. 109-17.000.

Peteri, Dezso: *See—*
Scherm, Arthur; and Peteri, Dezso, 3,723,446.

Peterlein, Karl: *See—*
Muller, Helmut; and Peterlein, Karl, 3,723,516.

Peters & Co., Inc.: *See—*
Cummings, Gilbert A., 3,722,700.
Healy, James W., 3,722,970.

Peters, Gerardus Johannes Anthonius, to U.S. Philips Corporation, mesne. Semiconductor device having a closed conductive rubber ring clamped around all electric conductors. 3,723,834, Cl. 317-234.00r.

Petersen, Paul I., to Dorr-Oliver Incorporated. Rotary pump having swash type impeller. 3,722,804, Cl. 241-46.110.

Peterson, Curtis R.: *See—*
Carpenter, Robert E.; and Peterson, Curtis R., 3,723,390.

Peterson, Donald E., to Allis-Chalmers Manufacturing Company. Torsion bar draft load adjuster. 3,722,598, Cl. 172-10.000.

Peterson, Donald J., to Procter & Gamble Company, The. Method of controlling weeds with organotin compounds. 3,723,089, Cl. 71-94.000.

Peterson, Thomas G.; and Giguere, Irving J., to Superior Electric Company, The. Output voltage adjusting circuit. 3,723,852, Cl. 323-8.000.

Petit, Georges. Silo discharge control. 3,722,747, Cl. 222-56.000.

Petrecz, Michael F., to Little Warrior Co. Electric shock protection device. 3,722,788, Cl. 231-2.00e.

Petro-Tex Chamical Corporation: *See—*
Barone, Bruno J.; and Croce, Louis J., 3,723,515.
Barone, Bruno J.; and Croce, Louis J., 3,723,518.

Petro-Tex Chemical Corporation: *See—*
Tidwell, Calvin M.; and Henneberg, Val G., 3,723,564.

Petrov, Georgy Nikolaevich: *See—*
Lifshits, Viktor Senderovich; Grigoriev, Viktor Ivanovich; Petrov, Georgy Nikolaevich; and Papkov, Oleg Sergeevich, 3,723,701.

Petterec, Robert E., to Bell & Howell Company. Film strip projector. 3,722,771, Cl. 226-51.000.

Pettinato, Ferdinand E.: *See—*
Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., 3,723,137.

Peyer, Siegfried: *See—*
Schwartz, Hermann, 3,723,991.

Pfitzer, Robert L.; and Drakes, Russell J., to Wurlitzer Company, The. Coin accumulator circuit and apparatus. 3,722,649, Cl. 194-9.000.

Pfizer Inc.: *See—*
Augstein, Joachim; Ham, Allan L.; Leeming, Peter R.; and Snarey, Michael, 3,723,524.
Cronin, Timothy H.; and Hess, Hans-Jurgen E., 3,723,434.

Pfohler, Wolfgang, to Leitz, Ernst, G.m.b.H. Device for picking up sections from a microtome. 3,723,226, Cl. 156-556.000.

Pharis, Joe M.; and Adams, Frank H., to Universal Oil Products Company. Process for separating olefins from saturated hydrocarbons. 3,723,302, Cl. 208-310.000.

Phelan, Charles S.: *See—*
Wright, George H.; and Phelan, Charles S., 3,722,671.

Philco-Ford Corporation: *See—*
Gregerson, David A.; and Selm, Gerald J., 3,722,537.
Tozzi, Joseph, 3,723,807.

Phillips Arthur B.; and Thompson, Roy E. Wire dispenser. 3,722,825, Cl. 242-129.000.

Phillips, Eugene F.: *See—*
Khetani, Bhupendra N.; and Phillips, Eugene F., 3,722,725.

Phillips Petroleum Company: *See—*
Collie, Stafford D., 3,722,782.
Heckelsberg, Louis F., 3,723,562.
Henderson, Miles L., 3,723,565.
Holtz, Hans D., 3,723,495.
MacEwen, George E., 3,722,780.
Osburn, Carl L., 3,722,811.
Warzel, Fred M., 3,723,395.

Photo Plastic International: *See—*
Sesto, Louis J., 3,722,122.

Photophysics, Inc.: *See—*
Dahlquist, John A.; and Brodie, Ivor, 3,722,453.
Dahlquist, John A., 3,722,995.

Piatkowski, Paul; and Manfred, Birkholz, to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft. Drive having imbalance-rotatable shafts. 3,722,302, Cl. 74-61.000.

Pierce, Victor J.; and Prussin, Samuel B. Package for dispensing a warmed composition. 3,723,324, Cl. 252-90.000.

Pierson, Raymond C., Jr.; and Voytko, Charles L., to Hestrom Company. Stroller bumper. 3,722,906, Cl. 280-47.400.

Pietramale, Anthony M., to I-T-E Imperial Corporation. Pivoted float hydrometer comprising movable calibration weight. 3,722,292, Cl. 73-454.000.

Pietschmann, Helmut Richard, to Sybron Corporation. Take-up system for dental units and the like. 3,722,095, Cl. 32-22.000.

Pifferi, Giorgio, to Grupp Leptit S.p.A. Carbamic acid derivatives. 3,723,502, Cl. 260-471.00c.

Pike, John E., to Upjohn Company, The. Prostaglandin oximes and oxime ethers. 3,723,528, Cl. 260-566.00a.

Pilkington Brothers Limited: *See—*
Heseltine, Robert William; and Dawson, John Burt, 3,723,349.

Pillsbury Company, The: *See—*
Draper, James E.; and Rejsa, Jack J., 3,722,032.

Pinnow, Douglas A.; and Van Uitert, Le Grand Gerard, to Bell Telephone Laboratories, Incorporated. Low melting point optical transmission line. 3,722,981, Cl. 350-96.0wg.

Piretti, Giancarlo, to Anonima Castelli S.a.S. Structural components for the composition of disasemblable pieces of furniture. 3,722,704, Cl. 211-183.000.

Pistiner, Irving. Liquid filtering apparatus. 3,722,682, Cl. 210-123.000.

Pitegoff, Alexander D.; Wernikoff, Robert E.; and Cunningham, James E., to Electronic Image Systems Corporation. Adaptive binary state decision system. 3,723,649, Cl. 178-7.100.

Pitman, Richard W.: *See—*
Bass, Michel; and Pitman, Richard W., 3,722,651.

Pitney Bowes-Sage, Inc.: *See—*
Hoffman, Lionel B., 3,722,559.

Pitney-Bowes, Inc.: *See—*
Zucker, Fredric E.; Murphy, James P.; Smith, Lawrence J.; and Kaswer, Joseph, Jr., 3,723,655.
Zweig, Gilbert, 3,722,992.

Pitts, James William; and Steele, Charles Sam, to Jefferson Chemical Company, Inc. Decolorization of polyethylene polyamines. 3,723,529, Cl. 260-583.00n.

Pitts, Ralph W.; and Thomas, McKinely B., to United States Steel Corporation. Inside pipe burr removal tool. 3,722,362, Cl. 90-24.00b.

PKM Corporation: *See—*

Park, John H., Jr.; and Mortimore, William C., 3,723,667.
Plasser, Franz; and Theurer, Josef. Mobile ballast treating and rail fastening element engaging tool unit. 3,722,423, Cl. 104-17.00r.
Plastics, Inc.: *See—*
Formo, Jerome L., 3,723,037.
Plate, Geerardus G.; and van Hattem, Nicolaas. Jam detector. 3,722,773, Cl. 226-25.000.
Platter, Sandford: *See—*
Myers, Charles F.; and Platter, Sandford, 3,723,053.
Platz, Rolf: *See—*
Nagel, Otto; Platz, Rolf; and Fuchs, Werner, 3,723,545.
Plessey Handel und Investments A.G.: *See—*
Cowland, Frederick Claud, 3,722,005.
Davies, Guy Edward; and Wilson, Christopher Guy Scott, 3,722,521.
King, Frank Kennedy, 3,723,697.
Plostnieks, Janis, to McNeil Laboratories, Inc. (1-Alkoxyvinyl) 2-oxo-3-indoline acetates. 3,723,458, Cl. 260-325.000.
Plumley, Elizabeth Emmett, 1/2 to Brown, David A. Barbecue griddle. 3,722,402, Cl. 99-467.000.
Plummer, Ray A.: *See—*
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne, 3,722,589.
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne, 3,722,594.
Plunkett, Larry D., to Signode Corporation. Clip stack. 3,722,670, Cl. 206-56.0ac.
Pluscec, Josip: *See—*
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,723,406.
Pneumatic Scale Corporation: *See—*
Sterling, Walter S., 3,722,658.
Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes: *See—*
Delobelle, Emile Jean, 3,722,567.
Pneumo Dynamics Corporation: *See—*
Boyle, Robert F., 3,722,371.
Poat, Jeffrey G.: *See—*
Freye, James D.; and Poat, Jeffrey G., 3,722,398.
Podell, Jack F.; and Whelton, Robert M., to Fairchild Camera and Instrument Corporation. Use of anodized aluminum as electrical insulation and scratch protection for semiconductor devices. 3,723,258, Cl. 204-15.000.
Poettmann, Fred H., to Marathon Oil Company. Limiting contamination in waste disposal wells. 3,722,593, Cl. 166-305.00d.
Pohler, Alfred; and Hayek, Erich, to Metallwerk Plansee Aktiengesellschaft. Apparatus for coating materials of all kinds with a plastic coating, in particular for impregnating webs of insulating material with electrically conducting plastic dispersions. 3,22,462, Cl. 118-5.000.
Poignant, Jean-Claude: *See—*
Malen, Charles; Desnos, Monique; and Poignant, Jean-Claude, 3,723,466.
Polanin, Walter Richard: *See—*
lon, Forrest Fothergill; Polanin, Walter Richard; and Altherr, Russell George, 3,722,708.
Polaroid Corporation: *See—*
Costa, Peter F.; and Coughlan, Edward H., 3,722,389.
Drevitch, Nolan A., 3,722,393.
Van Allen, David; and Knight, Frank W., 3,722,383.
Poling, Dan W.; Calkins, Edward E.; and Fagaly, Robert L. Simulated fire apparatus. 3,723,046, Cl. 431-18.000.
Pollard, Ernest M., to General Electric Company. Current limiting static switch. 3,723,816, Cl. 317-20.000.
Poly-Choke Company, Incorporated, The: *See—*
Grahn, Arne Y., 3,722,148.
Polyakov, Anatoly Mikhailovich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.
Ponomarev, Nikolai Alexeevich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.
Pormale, Milda Yanovna: *See—*
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.
Porta, Paolo Della; and Rebaudo, Mauro, to S.A.E.S. Getters S.p.A. Mercury generation. 3,722,976, Cl. 316-3.000.
Porta Systems Corporation: *See—*
Carney, William V., 3,723,679.
Portnyagina, Vera Alexandrovna; and Morgun, Maria Ivanovna. Method of producing allylthioacetic acid. 3,723,519, Cl. 260-526.00s.
Potter, Edwin C., to Marine Science Industries, Inc. Mineral concentrator and method of concentrating. 3,722,678, Cl. 209-156.000.
Potter, Norman Leonard: *See—*
Eccles, Arnaud Michael; and Potter, Norman Leonard, 3,723,768.
Potter, Olin E.; and Tomasi, Biagio J., to Worthington Corporation. Liquid and gas separating assembly. 3,722,187, Cl. 55-323.000.
Poulsen, Stephen D., Jr., to Airco, Inc. Break seal. 3,723,081, Cl. 65-55.000.
Poulter, Thomas C.: *See—*
Homestead, Ronald E.; and Poulter, Thomas C., 3,722,472.
Poveromo, Melvin D. Dental mandrel. 3,722,098, Cl. 32-5.000.
Powell, Stanley: *See—*
Cole, Colin Francis; and Powell, Stanley, 3,723,149.
Powell, Walter W.; and Howland, Dennis L., to Anderson, Greenwood & Co. Relief valve. 3,722,852, Cl. 251-61.200.
Power Control Corporation: *See—*
Opal, Kenneth E.; Kelly, Charles R.; and Newcamp, Charles W., 3,723,840.
Powers and Sons: *See—*
Freudenberger, John E., 3,722,907.
Poynor, Paul C.; and Kegler, William H. Process for producing ammonium phosphates and polyphosphates. 3,723,086, Cl. 71-29.000.
PPG Industries, Inc.: *See—*
Bissinger, William E.; Hardiss, Donald E.; and Lavanish, Jerome M., 3,723,538.
Dowbenko, Rostyslaw, 3,723,398.
Franz, Helmut, 3,723,138.
Greenberg, Charles B.; and Crissman, Roy G., 3,723,155.
Hay, William J., Jr., 3,723,312.
Miller, Richard G., 3,723,158.
Pratt-Read Corporation, mesne: *See—*
Allen, Irving; George, Edward T.; and Nordquist, Albert W., 3,722,351.
Prause, Dieter: *See—*
Heinrich, Frank-Armin; Prause, Dieter; and Sost, Rolf, 3,723,641.
Preformed Line Products Co.: *See—*
Eucker, Robert A., 3,723,636.
Preisler, Eberhard; Harnisch, Heinz; and Mietens, Gerhard, to Knapsack Aktiengesellschaft. Electrolytic production of manganese dioxide. 3,723,265, Cl. 204-83.000.
Prelude Corporation: *See—*
Whipple, William D.; and Gifford, Howard W., 3,722,126.
Price, Harry J., to Eastman Kodak Company. Photographic developers with titanous diethylenetriaminepentaacetic acid. 3,723,126, Cl. 96-61.00m.
Priegnitz, James W., to Universal Oil Products Company. Selective separation of butene-1 from a C_4 hydrocarbon mixture employing zeolite X and Y. 3,723,561, Cl. 260-677.0ad.
Prietzel, Horst, to Suddeutsche Kalkstickstoff-Werke AG. Process for preparing salts of alkyl and alkenylguanidines. 3,723,511, Cl. 260-501.140.
Prince, Zodell W.; Weatherholt, Dallas D.; and Trombatore, Adelene L. Method and apparatus for making hair curlers. 3,723,219, Cl. 156-218.000.
Principe, Pacifio A.: *See—*
Levine, Seymour D.; and Principe, Pacifio A., 3,723,508.
Probasco, Charles W., to Anchor Hocking Corporation. Vacuum elevating conveyor. 3,722,665, Cl. 198-184.000.
Procter & Gamble Company, The: *See—*
Adams, Frank S., 3,723,548.
Diehl, Francis L., 3,723,322.
Parran, John J., Jr., 3,723,325.
Peterson, Donald J., 3,723,089.
Proctor, Stephen G., to United States of America, Atomic Energy Commission. Rare earth removal from americium oxide. 3,723,594, Cl. 423-11.000.
Production Engineering Research Association of Great Britain: *See—*
Johns, Antony; Tiley, Michael; and McDonnell, Patrick, 3,723,268.
Production Machinery Corporation: *See—*
Withrow, David A., 3,722,251.
Prokop, Bohdar, to Fruehauf Corporation. Panel assembly system. 3,722,157, Cl. 52-211.000.
Proksch, Frederick D.: *See—*
Butterfield, Max E.; Hoerr, Richard H.; McLees, Alan L.; and Proksch, Frederick D., 3,722,618.
Province, William F., to Ridge Tool Company, The. Fusion heater. 3,723,705, Cl. 219-243.000.
Prussin, Samuel B.: *See—*
Pierce, Victor J.; and Prussin, Samuel B., 3,723,324.
Puckett, Lloyd S. Foldable wheelbarrow. 3,722,904, Cl. 280-36.00r.
Pullman Incorporated: *See—*
Leduc, Joseph-Adrien; Konrad, Peter; and Troemel, Gerhard, 3,723,264.
Purdue Research Foundation: *See—*
Bachman, Gustave Bryant; and Maleski, Robert Joseph, 3,723,546.
Pye Limited: *See—*
Loveday, George Christopher, 3,723,734.
Quaker Oats Company, The: *See—*
Bixby, Douglas G.; and Helmke, Kenneth L., 3,723,131.
Brown, Lloyd H.; Eftax, Daniel S. P.; Everett, George S.; and Oldham, James R., 3,723,368.
Freye, James D.; and Poat, Jeffrey G., 3,722,398.
Questor Corporation: *See—*
Rousey, Donald L., 3,722,167.
Radford, David L., to Vital Assists, Inc. Hemodialysis. 3,723,305, Cl. 210-22.000.
Radiation Dynamics, Inc.: *See—*
Thompson, Chester C., Jr., 3,723,846.
Radiation Incorporated: *See—*

Beasom, James D., 3,722,079.
Radulescu, Valentin, to IPCUP-Institutul de Proiectari si Cercetari Utilaj Petrolier. Torque-controlled pipe-thread tightener. 3,722,331, Cl. 81-52.400.
Rae, Barney O.: *See—*
Cotton, Ronald K.; and Rae, Barney O., 3,723,841.
Ragan, William Leon: *See—*
Rumph, Wilbur C.; and Ragan, William Leon, 3,722,303.
Raidl, John H., Jr. Safety relief device. 3,722,734, Cl. 220-89.000.
Raines, Kenneth: *See—*
Burke, George K.; and Raines, Kenneth, 3,722,697.
Rakus, Julius P.; Penoyer, John A.; and Kowalski, Michael, to Celanese Corporation. Bonding of aromatic polyamide film. 3,723,241, Cl. 161-227.000.
RAM Enterprises, Incorporated: *See—*
Waldecker, Donald E., 3,722,623.
Ram, Michael J., to Celanese Corporation. Process for the production of a continuous length of graphitic fibrous material. 3,723,605, Cl. 23-209.300.
Ramler, Warren J.: *See—*
Nixon, Jack M.; and Ramler, Warren J., 3,723,785.
Ramquist, Frederick C.: *See—*
Gleim, William K. T.; and Ramquist, Frederick C., 3,723,560.
Ranco Incorporated: *See—*
Randall, James E., 3,722,522.
Randall, James E., to Ranco Incorporated. Vortex fluid amplifier with noise suppresser. 3,722,522, Cl. 137-812.000.
Rao, Velliyur N. P.: *See—*
Druin, Melvin L.; Ferment, George R.; and Rao, Velliyur N. P., 3,723,150.
Ratkay, Edward J.: *See—*
Mazur, Joseph N.; Ratkay, Edward J.; and Hodgson, Robert F., 3,722,540.
Ratts, Kenneth Wayne, to Monsanto Company. Aryl methyl phenacyl sulfonium tetrafluoroborates. 3,723,534, Cl. 260-590.000.
Rauh, Jack, to Modern Faucet Manufacturing Company. Adjustable shower head assembly with diverter valve. 3,722,799, Cl. 239-443.000.
Rauh, Jack K.: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Raupp, Ray J., to Bendix Corporation, The. Positive and negative pressure responsive reservoir breather. 3,722,535, Cl. 137-493.400.
Ray, Jack H., to Tenneco Oil Company. Method for drilling a well. 3,722,607, Cl. 175-57.000.
Raydt, Jost-Hinrich. Animal food stuff press. 3,723,042, Cl. 425-331.000.
Raymond, Maurice A.; and Scardera, Michael, to Olin Corporation. Alkali-halogenated solvent emulsion system. 3,723,341, Cl. 252-312.000.
Raytheon Company: *See—*
Walsh, George M., 3,723,952.
Raza, Syed H.: *See—*
Froning, H. R.; Raza, Syed H.; and Askew, Warren S., 3,722,590.
RCA Corporation: *See—*
Gorog, Istvan, 3,723,651.
Law, Harold Bell, 3,722,044.
Sterner, John Franklin; and Hanchett, George Draper, 3,723,905.
Wheatley, Carl Franklin, Jr., 3,723,833.
Rebaudo, Mauro: *See—*
Porta, Paolo Della; and Rebaudo, Mauro, 3,722,976.
Redd, Russell, Jr.: *See—*
Dinsdale, Vern Thomas; Redd, Russell, Jr.; and Meyer, Robert E., 3,723,206.
Rederiaktiebolaget Nordstjernan: *See—*
Svanstrom, Elis Kjell Ake, 3,723,601.
Redman, Michael J., to Kennecott Copper Corporation. Rare earth tellurites and method of producing same. 3,723,600, Cl. 423-264.000.
Rees, Alfred, to Lucas, Joseph, (Industries) Limited. Ignition distributor base plate having integral resilient securing means. 3,723,691, Cl. 200-168.00r.
Rees, Herbert, to Husky Manufacturing & Tool Works Limited. Injection-molding machine with transverse feed. 3,723,040, Cl. 425-245.000.
Reese, James D. Lighting system. 3,723,045, Cl. 431-18.000.
Reese, Johannes; and Hotze, Hermann, to Chemische Werke Albert. Synthetic resins. 3,723,572, Cl. 260-860.000.
Reese Products, Inc.: *See—*
Reese, Terrell J., 3,722,920.
Reese, Terrell J., to Reese Products, Inc. Hydraulic stabilizing device. 3,722,920, Cl. 280-446.00b.
Regie Nationale des Usines Renault: *See—*
Rivere, Jean-Pierre, 3,722,486.
Ventre, Pierre, 3,722,027.
Reich, Arturo; and Huder, Guido. Fire-fighting auxiliary apparatus. 3,722,823, Cl. 242-86.000.
Reiman, Peter A.: *See—*
Dwyer, James L.; and Reiman, Peter A., 3,722,696.
Reimann, George A.; and Martin, William R., to United States of America, Atomic Energy Commission. Process for producing a fine-grained 316 stainless steel tubing containing a uniformly distributed intragranular carbide phase. 3,723,193, Cl. 148-12.300.
Reimers Getriebe A.G.: *See—*
Steuer, Herbert, 3,722,308.
Reinhardt, Robert M.; and Kullman, Russell M. H., to United States of America, Agriculture. Removal of free formaldehyde from solutions of methylolated carbamate finishing agents and textiles treated therewith. 3,723,058, Cl. 8-116.300.
Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., to Merck & Co., Inc. Resolution of DL-α-amino-α-vanillylpropionitriles. 3,723,496, Cl. 260-465.00e.
Reinke, Friedhelm: *See—*
Seulen, Gerhard; and Reinke, Friedhelm, 3,723,198.
Reinz Dichtungs-Gesellschaft: *See—*
Von Benningsen, Gerd, 3,722,898.
Rejsa, Jack J.: *See—*
Draper, James E.; and Rejsa, Jack J., 3,722,032.
Reliance Electric Company, mesne: *See—*
Michels, Charles E., 3,722,177.
Renfroe, Harris B.: *See—*
Hall, Luther A. R.; Gurney, John A.; and Renfroe, Harris B., 3,723,547.
Renner, Darwin S. Automatic noise nulling circuit. 3,723,883, Cl. 325-476.000.
Reply-O-Letter Company, Inc.: *See—*
Buchheit, Joseph J., 3,722,787.
Republic Steel Corporation: *See—*
Hultgren, Frank A.; and Kot, Richard A., 3,723,194.
Rex Chainbelt Inc.: *See—*
Chandre, Arthur J.; and Moericke, Dieter, 3,722,422.
Rexham Corporation, mesne: *See—*
Loomis, Clifford R., Jr.; Wiles, Jerald R.; and Newton, Russell A., 3,722,656.
Rey, Ivor Allan; and Krout, Victor Edmund, to Sebel Limited. Upholstered furniture. 3,722,954, Cl. 297-452.000.
Reynolds, Blake, to Texaco Development Corporation. Oxo-synthesis gas. 3,723,344, Cl. 252-373.000.
Reynolds, Blake, to Texaco Development Corporation. Synthesis gas process. 3,723,345, Cl. 252-373.000.
Reynolds, Martin Lance; Hammersmith, James R.; and Parish, Harlie A., Jr., to Brown & Williamson Tobacco Corporation. Cigarette with modified paper wrapper. 3,722,515, Cl. 131-15.00b.
Reynolds Metals Company: *See—*
Vickstrom, Donald E.; and Swenck, George F., 3,722,473.
Vickstrom, Donald E., 3,722,474.
Reynolds, Richard W.; and Weber, Kent, to Sundstrand Corporation. Auxiliary hydraulic power supply. 3,722,217, Cl. 60-39.480.
Reynolds Submarine Services Corporation: *See—*
Markel, Arthur L.; and Wirsching, Robin F., 3,722,689.
Wirsching, Robin F., 3,722,688.
Reynolds, Thomas J.: *See—*
Aplet, Everett Lloyd; and Reynolds, Thomas J., 3,722,769.
Reznik, Alan A.; and Reznik, Marion. Device for operating the toggle arm of a conventional light switch. 3,722,319, Cl. 74-544.000.
Reznik, Marion: *See—*
Reznik, Alan A.; and Reznik, Marion, 3,722,319.
Rheinstahl Aktiengesellschaft: *See—*
Schallehn, Hans-Georg, 3,722,357.
Rhody, Howard A. Tie down anchor. 3,722,911, Cl. 280-179.00r.
Ricard, Louis, to Compagnie Generale d'Electricite. Method and apparatus for determining the existence of a defect in an electrical line and its location. 3,723,864, Cl. 324-52.000.
Rice, Lynn H., to Universal Oil Products Company. Process for the recovery of heat from hydrocarbons and the separation thereof. 3,723,301, Cl. 208-213.000.
Rich, David: *See—*
Aidlin, Samuel S.; Aidlin, Stephen H.; and Rich, David, 3,722,659.
Rich, Harold, to General Electric Company. Three-wire, three-phase watt-varmeter. 3,723,872, Cl. 324-141.000.
Richard, William R., Jr.: *See—*
Herber, John F.; Street, Robert W.; and Richard, William R., Jr., 3,723,320.
Richards, Edward Gordon; Fontaine, Paul Isidore; and Fleetwood, Michael John, to International Nickel Company, Inc., The. Nickel-chromium-cobalt alloys for use at relatively high temperatures. 3,723,107, Cl. 75-171.000.
Richards Kenneth J.: *See—*
Spedden, Henry Rush; Richards Kenneth J.; and Schlitt, William J., III, 3,723,598.
Richardson, Ralph A.: *See—*
Laliberte, Albert J.; and Richardson, Ralph A., 3,722,985.
Richardson, Rolland A., to Pacific Press & Shear Corporation. Precision anti-whip ram type machine. 3,722,366, Cl. 91-179.00r.
Richens, Robert H.: *See—*
Hungerford, Philip C., Jr.; and Richens, Robert H., 3,722,341.
Richey, Charles F., to Data Time, Inc. Stopwatch-timer assembly with improved stopwatch contact mechanism. 3,723,675, Cl. 200-38.00r.
Richter, Sidney B.; and Levin, Alfred A., to Velsicol Chemical Corporation. Thiocyanoacetamides. 3,723,439, Cl. 260-283.0cn.
Richtzenhain, Hermann: *See—*
Blumenfeld, Georg; Daum, Gerhard; and Richtzenhain, Hermann, 3,723,468.
Rickrode, Cyril J.; and Becker, Charles A., to Cam Industries, Inc. Method and machine to de-bur commutator bars. 3,722,144, Cl. 51-50.00r.
Ricoh Co., Ltd.: *See—*
Kamata, Takeshi, 3,723,711.
Kobayashi, Yugoro, 3,722,340.

Riddell, Inc.: *See—*
Morgan, Gerard E., 3,722,112.
Ridder, Hubert: *See—*
Icking, Paul; and Ridder, Hubert, 3,722,761.
Ridge Tool Company, The: *See—*
Province, William F., 3,723,705.
Rieck, Henry G.: *See—*
Wogman, Ned A.; Perkins, Richard W.; Rieck, Henry G.; and Cooper, John A., 3,723,727.
Riese, Hans-Walter: *See—*
Kempf, Reiner; and Riese, Hans-Walter, 3,722,643.
Krajs, Helmut; and Riese, Hans-Walter, 3,722,647.
Rieter Machine Works, Ltd.: *See—*
Staheli, Paul, 3,722,260.
Rigert, Max, to McGraw-Edison Company. Quick closing mechanism for circuit interrupter. 3,723,686, Cl. 200-153.0sc.
Riley, James A.: *See—*
Treharne, Richard W.; Riley, James A.; and Thomas, Eddie R., 3,722,283.
Riley, Neil R.: *See—*
Borg, Richard J.; Lai, David Y. F.; Riley, Neil R.; and Wolfe, James R., 3,723,359.
Rinck, Albert, to Societe Anonyme Gambin S.A. Universal milling spindle-carrying unit. 3,722,361, Cl. 90-17.000.
Rinecker, Ulf F., to Envirotech Corporation. End connector for heat exchangers. 3,722,582, Cl. 165-143.000.
Ring, Albert W. Remotely operated electrical combination lock. 3,722,238, Cl. 70-278.000.
Rinkel, Gerardus, to Bitumarin N.V. Support means for slope revetments. 3,722,222, Cl. 61-38.000.
Ripper, Jose Ellis: *See—*
Paoli, Thomas Lee; and Ripper, Jose Ellis, 3,723,903.
Risdon Manufacturing Company, The: *See—*
Wakeman, Alfred W.; and Kotuby, Paul M., 3,722,748.
Riso, Rocco R.; and Lemberg, Seymour, to Stepan Chemical Company. Process for producing 2-pinanol. 3,723,542, Cl. 260-631.500.
Ritchey, Thomas W., Jr., to Ampex Corporation. Method of erasing signals from magnetic discs using DC pulses which persist for one disc revolution. 3,723,668, Cl. 179-100.20d.
Ritter, George F., Jr.; and King, Roger P., to Libbey-Owens-Ford Company. Textured conveyor roll and method of finishing the same. 3,723,083, Cl. 65-119.000.
Ritter, Reinhold: *See—*
Ziebarth, Paul E.; and Ritter, Reinhold, 3,723,284.
Rittler, Hermann L.: *See—*
Beall, George H.; and Rittler, Hermann L., 3,723,140.
Rival Manufacturing Company: *See—*
McLean, Robert E.; and Farkas, Joseph J., 3,722,089.
Rivarossi S.p.A.: *See—*
Rossi, Alessandro, 3,722,131.
Rivere, Jean-Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Ignition timing devices for internal combustion engines. 3,722,486, Cl. 123-117.00a.
Rivman, Samuel Joseph, to Grace, W. R., & Co. Re-usable handle bag. 3,722,785, Cl. 229-54.00r.
Rivoir, Karl Heinz. Means for the resilient securing of tooth substitutes. 3,722,094, Cl. 32-2.000.
Robbins Company, The: *See—*
Klein, Harold T.; and West, Harold H., 3,722,601.
Robbins, Daniel H.: *See—*
Cunha, Harold; Dickman, William M.; and Robbins, Daniel H., 3,722,999.
Robbins, James F., to Sybron Corporation. Coupling and/or joining lined pipe. 3,722,925, Cl. 285-55.000.
Robbins, William Paul; and Bullock, Clifford R. Plastic zipper/closure for flexible containers. 3,722,039, Cl. 24-201.00c.
Roberts, Donald B. Infusion guard and immobilizer. 3,722,508, Cl. 128-133.000.
Roberts, Reginald F., Jr., to Dow Chemical Company, The. Process for cleaving dichloroisopropyl ether. 3,723,544, Cl. 260-633.000.
Robertson, Frederick: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Robertson, Gary: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.
Robertson, Jerry E.; Harrington, Joseph Kenneth; and Banitt, Elden H., to Minnesota Mining and Manufacturing Company. Fluorocyanoacrylates. 3,722,599, Cl. 128-334.000.
Robinson, Ralph O., Jr., to United States of America, Navy. Base fuze. 3,722,417, Cl. 102-70.20p.
Robinson, Ralph R. Abortive device and method. 3,722,500, Cl. 128-1.00r.
Robota, Stephen, to Hooker Chemical Corporation. Preparation of octachlorocyclopentene using ultraviolet light. 3,723,272, Cl. 204-163.00r.
Rodden, Joseph P. Explosion proof aerosol can. 3,722,759, Cl. 222-396.000.
Rodely, Alan E.; and Fussell, Theodore J., to Eastech, Inc. Bluff body flowmeter arrangement for use in controlling air pollution produced by internal combustion engines. 3,722,275, Cl. 73-194.00b.
Rodriguez, Leopoldo; and Birk, Donald G. Device for sharpening the tapered points of dental instruments. 3,722,146, Cl. 51-73.00r.
Roegler, Manfred: *See—*
Moller, Friedrich; Roegler, Manfred; Simmler, Walter; and De Montigny, Armand, 3,723,492.
Rogers, Beverly W. Torque converter. 3,722,325, Cl. 74-751.000.
Rogers, Cedric G., to Avco Corporation. Indium antimonide infrared ray detector. 3,723,831, Cl. 317-234.00r.
Rogers, Donald H., to Jerrold Electronics Corporation. Power supply with temperature compensated current foldback. 3,723,774, Cl. 307-296.000.
Rogers, John R.: *See—*
Morgan, Lee W.; and Rogers, John R., 3,723,358.
Rogers, Mark C. Ram operated diamond core drill press. 3,722,602, Cl. 173-32.000.
Rohe Scientific Corporation: *See—*
Natelson, Samuel, 3,722,790.
Rohlfs, Hans: *See—*
Skurnia, Uwe; and Rohlfs, Hans, 3,723,603.
Rohm & Haas Company: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., 3,723,523.
Lutz, John T., Jr.; and Lane, Constance A., 3,723,369.
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,723,452.
Miller, George A., 3,723,488.
Rossell, Gary L.; Fleisher, Paul C., Jr.; and Seifer, Maurice I., 3,722,000.
Rohn & Haas Company: *See—*
Hoey, Charles Edwin, 3,723,213.
Rohrberg, Roderick G.; and Harvey, Don E., to North American Rockwell Corporation. Tube joining means. 3,722,778, Cl. 228-13.000.
Romicon, Inc., mesne: *See—*
Agranat, Edward A., 3,722,694.
Rose, Edwssa H.: *See—*
Stebbins, George B.; Stebbins, James F.; and Becker, John G. (said Becker, John G., assor. to), 3,722,687.
Rose, James S.: *See—*
McLaughlin, Alexander; Nadeau, Herbert G.; and Rose, James S., 3,723,364.
Rose Manufacturing Company: *See—*
Frost, Richard H.; Maguire, John; and Sharp, Jonathan E., 3,723,036.
Rosen, Harold A.: *See—*
Andrews, George J.; and Rosen, Harold A., 3,722,840.
Rosenberg, William E., to Hull, R. O., & Company, Inc. Composition of baths for electrodeposition of bright zinc from aqueous, acid, electroplating baths. 3,723,263, Cl. 204-55.00r.
Rosengrant, Barry L.: *See—*
Deeds, Douglas; and Rosengrant, Barry L., 3,722,972.
Rosenow, Heinz: *See—*
Amrhein, Heinz G.; Stander, Herman; and Rosenow, Heinz, 3,722,145.
Rosling, Thomas H.: *See—*
Fox, John O.; and Rosling, Thomas H., 3,722,408.
Ross, John P.: *See—*
Johnson, Frank J.; Walker, Nelson L.; and Ross, John P., 3,723,283.
Rossell, Gary L.; Fleisher, Paul C., Jr.; and Seifer, Maurice I., to Rohm & Haas Company. Method for reinforcing textile garments with thermosetting films. 3,722,000, Cl. 2-227.000.
Rossi, Alessandro, to Rivarossi S.p.A. Bridge for miniature trains. 3,722,131, Cl. 46-1.00k.
Rossmy, Gerd; and Koerner, Gotz, to Goldschmidt, Th., A.G. Polysiloxane-polyalkyleneglycol block copolymers suitable as foam stabilizers in the manufacture of polyurethane foams. 3,723,491, Cl. 260-448.20b.
Roth, Oyvind: *See—*
Coburn, Ronald L.; and Roth, Oyvind, 3,723,748.
Rous, Arthur, to Grand City Container Corporation. Carton. 3,722,783, Cl. 229-40.000.
Rousey, Donald L., to Questor Corporation. Runner for ceiling suspension. 3,722,167, Cl. 52-726.000.
Roussel UCLAF: *See—*
Allais, Andre; and Girault, Pierre, 3,723,091.
Roussel-UCLAF: *See—*
Martel, Jacques, 3,723,469.
Rouyer, Georges, to Societe National Industrielle Aerospatiale. Corrugation of thin sheet. 3,722,247, Cl. 72-106.000.
Rowe, Harrison Edward; and Young, Dale Travis, to Bell Telephone Laboratories, Incorporated. Multimode waveguide with reduced dispersion. 3,723,921, Cl. 333-95.00r.
Roy, Lynn H. Submarine pipeline trencher. 3,722,224, Cl. 61-72.400.
Royal Industries, Inc.: *See—*
McKenney, John D., 3,722,570.
Rozenfeld, Matvei Iosifovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.
Rubbermaid Incorporated: *See—*
Taylor, William D., 3,722,975.
Rudy, Erwin, to Aerojet-General Corporation. Refractory metal alloy bonded carbides for cutting tool applications. 3,723,104, Cl. 75-134.00m.
Rudzitis, Karl: *See—*
Scheinderman, Abraham; Rudzitis, Karl; Brandsdorfer, Arthur; and Wechsler, George, 3,722,774.
Rueff, Herbert: *See—*

Maulini, Maurizio; Aiuola, Franco; and Rueff, Herbert, 3,722,175.

Ruetman, Sven H., to Dow Chemical Company, The. Perchlorinated vinyl pyrazines. 3,723,431, Cl. 260-250.00r.

Ruetz, Lloyd B.: *See—*
Hughes, Robert G.; and Ruetz, Lloyd B., 3,722,737.

Rumball, Paul G.: *See—*
Kitchener, Charles J.; and Rumball, Paul G., 3,722,441.

Rumpelein, Fritz: *See—*
Kisselmann, Willy; Rumpelein, Fritz; and Kope, Paul, 3,722,459.

Rumpf, Jurg: *See—*
Weiss, Claus Dieter; and Rumpf, Jurg, 3,723,415.

Rumph, Wilbur C.; and Ragan, William Leon, to Blue Bird Body Company. Bus door operator with positive latch. 3,722,303, Cl. 74-96.000.

Runyan, Wesley G.; and Staley, Lewis E., to Collins Radio Company. Servo stabilized meter apparatus. 3,723,871, Cl. 324-99.00r.

Rupp, Hans-Dieter; and Magerlein, Helmut, to Glanzstoff AG. Process for removing thiourea as an impurity from alkali- and alkaline earth-metal rhodanides. 3,723,604, Cl. 423-366.000.

Rushmere, John Derek, to Du Pont de Nemours, E. I., and Company. Acid nickel electroplating. 3,723,260, Cl. 204-49.000.

Rushmere, John Derek, to Du Pont de Nemours, E. I., and Company. Acid zinc electroplating. 3,723,262, Cl. 204-55.00r.

Russeler, Gerhard: *See—*
Hans, Joachim; Ditschler, Hans Jorgen; and Russeler, Gerhard, 3,722,359.

Russell, Barney G. Safety lighter. 3,723,048, Cl. 431-151.000.

Russell, Carl D., 1% to Overholt, Harvey C., Overholt, Anne E., 1% to Kygar, W. L., 5% to Parker, R. A. and Parker, Evelyn B. Combination time delay and self-actuating voltage level protective circuit for vehicular electrical systems. 3,723,752, Cl. 307-100bp.

Ruthel, Walter W.: *See—*
Currey, John E.; and Ruthel, Walter W., 3,723,266.

Rutman, Robert J., to University of Pennsylvania, The Trustees of the. N,N'-(Ethylene)-4,4'-bipiperidyl dechloride growth promoting compound and method of using same. 3,723,621, Cl. 424-267.000.

Ryan, Carl R. Current mode matched filter for digital data. 3,723,770, Cl. 307-256.000.

Ryser, Raymond, to Manufacture de boites de Montres S. Graber S.A. Hermetic watch-case. 3,722,208, Cl. 58-90.00r.

S. T. Supont Societe Anonyme: *See—*
Bouvier, Daniel, 3,723,051.

S.A. Gordini Automobiles: *See—*
Gordini, Amedee, 3,722,484.

S.A. Molinario: *See—*
Molinario, Rene, 3,722,517.

Saab-Scania Aktiebolag: *See—*
Granlund, Gosta Holger, 3,723,965.

Sabel, Nathan W.: *See—*
Gauchat, Richard H.; and Sabel, Nathan W., 3,723,944.

S.A.E.S. Getters S.p.A.: *See—*
Porta, Paolo Della; and Rebaudo, Mauro, 3,722,976.

Safe Key Lock Company: *See—*
Pecott, Clyde E., 3,723,682.

Safronov, Sergei Fedorovich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nikolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.

Sage, Warnie L.: *See—*
McIlroy, Robert A.; Sage, Warnie L.; and Markant, Henry P., 3,723,068.

Sahpiro, Robert C., to Timex Corporation. Driving circuit for liquid crystal displays. 3,723,749, Cl. 307-38.000.

Saint-Gobain, mesne: *See—*
Battigelli, Jean, 3,723,362.

Saint-Gobain Techniques Nouvelles: *See—*
Cherel, Guy Henry, 3,722,338.

Saito, Takashi: *See—*
Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, 3,722,994.

Saito, Tamekazu: *See—*
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, 3,723,093.

Sakakibara, Naoji; Kawabata, Yasuhiro; and Tsukuba, Korehiko, to Aisin Seiki Kabushiki Kaisha. Method and apparatus for causing constant traveling speed of automative vehicle. 3,722,614, Cl. 180-105.00e.

Sakamoto, Teruya; Nishimura, Takemi; and Takarada, Osamu. Extensible boom with buckling-prevention. 3,722,154, Cl. 52-121.000.

Saltus, George Edwin: *See—*
Bunce, Michael Kelly; Bush, Stanley Edward; Fargo, George Arthur, Jr.; and Saltus, George Edwin, 3,723,654.

Samp, Inc.: *See—*
Johnson, Frank J.; Walker, Nelson L.; and Ross, John P., 3,723,283.

Samples, Everett L. Eddy current test probe using an oscillator mounted in a digitally manipulatable housing. 3,723,861, Cl. 324-40.000.

Samuels, Abe, to Speed-O-Print Business Machines Corporation. Rollers. 3,722,050, Cl. 29-129.500.

Sander, Manfred: *See—*
Erlemann, Gustav; Sander, Manfred; and Zimmer, Gerhard, 3,723,616.

Sandoval, Dante J.: *See—*
Logan, Lewis J.; and Sandoval, Dante J., 3,723,698.

Sandoz Wander, Inc.: *See—*
Anderson, Paul L.; Houlihan, William J.; and Manning, Robert E., 3,723,620.

Sandoz-Wander, Inc.: *See—*
Coombs, Robert V., 3,723,483.
Houlihan, William J., 3,723,090.
Ott, Hans, 3,723,432.

Sansing, James Earl, Jr.: *See—*
Klingelhoefer, William Christian; and Sansing, James Earl, Jr., 3,723,606.

Sargent and Company: *See—*
Bauer, Charles A.; and Floyd, Alfred E., 3,722,938.

Sargent, John A.; and Straub, Francis W., to Dow Chemical Company, The. Article for fabricating permeable hollow fiber separatory element tube sheets and separatory elements prepared therefor. 3,722,695, Cl. 210-321.000.

Sarracino, Marcello; Ferrentino, Antonio; and Borroni, Andrea, to Industries Pirelli Societa per Azioni. Equipment for laying or recovering submarine cables. 3,722,775, Cl. 226-100.000.

Sarring, Ernest J., to North American Rockwell Corporation. Feed, transport and delivery mechanism for book trimmers and the like. 3,722,336, Cl. 83-63.000.

Sasaki, Tsutomu: *See—*
Wakabayashi, Ikuzo; and Sasaki, Tsutomu, 3,722,662.

Saternus, Joseph P., to Borg-Warner Corporation. Adjustable hospital bed instantly movable to a Trendelenburg position. 3,722,010, Cl. 5-67.000.

Sather, Dalaine C., to Collins Radio Company. Digital servo motor control with an error rate derivative circuit. 3,723,842, Cl. 318-602.000.

Sather, Delaine C., to Collins Radio Company. Pulse stretching apparatus. 3,723,886, Cl. 328-58.000.

Satkin, David M.; Helvie, Gene B.; and Tillotson, Charles J., to Architectural Partitions. Apparatus for constructing removable partition walls. 3,722,163, Cl. 52-122.000.

Sato, Yoshio. Method for producing the base of a semiconductor device. 3,722,080, Cl. 29-581.000.

Satoh, Haruki: *See—*
Suwa, Koichiro; Satoh, Haruki; and Shida, Atsuo, 3,722,516.

Sauer, Gerhard: *See—*
Eder, Ulrich; and Sauer, Gerhard, 3,723,471.

Sauer, Harold Alfred, to Bell Telephone Laboratories, Incorporated. Heat exchanger with adjustable conduit transit size for carrier. 3,722,581, Cl. 165-96.000.

Savage, Elton S.; and Heaney, Donald F., to Dravo Corporation. Gas diffuser. 3,722,836, Cl. 261-1.000.

Sawai, Satoshi; Maekawa, Jusaburo; and Tanaka, Yoshimi, to Daikin Hogyo Co., Ltd. Reversible rotary compressor for refrigerators. 3,723,024, Cl. 418-159.000.

Sawtschenko, Alexander P.: *See—*
Betts, William K.; and Sawtschenko, Alexander P., 3,723,971.

Sawyer, Philip Nicholas. Method of screening substances for use in the treatment of circulatory system diseases. 3,722,504, Cl. 128-2.10r.

Scan-Optics, Inc., mesne: *See—*
Stoller, Milton, 3,723,970.

Scardera, Michael: *See—*
Raymond, Maurice A.; and Scardera, Michael, 3,723,341.

Scarpino, Theodore J.; and Holbrook, Douglas W., to United States of America, Navy, The. Distortion correction system. 3,723,805, Cl. 315-27.0gd.

Schadow, Rudolf. Push button switch units. 3,722,313, Cl. 74-483.0pb.

Schaffner, Kurt: *See—*
Jeger, Iskar; Wehrli, Hans Ueli; and Schaffner, Kurt, 3,723,418.

Schallehn, Hans-Georg, to Rheinstahl Aktiengesellschaft. Armored vehicle. 3,722,357, Cl. 89-36.00h.

Schaltegger, Herbert. Apparatus for picking up labels from a supply stack and directly applying the labels to containers. 3,723,228, Cl. 156-568.000.

Schartmann, Knut Roger, to Northern Electric Company Limited. Repetitive pulse generating circuit. 3,723,829, Cl. 317-141.00s.

Scharwat, Anna Maria, nee Strassel. Plier-like champagne cork remover. 3,722,327, Cl. 81-3.10r.

Schats, Cornelis: *See—*
Jacobus, Johannes; Schats, Cornelis; and Schenk, Hendrik, 3,723,355.

Schatz, Friedrich: *See—*
Ziemek, Gerhard; Schatz, Friedrich; and Aust, Karoly, 3,722,777.

Schaufele, Robert F., to Owens-Illinois, Inc. Gas discharge panel with photoconductive material. 3,723,977, Cl. 340-173.0pl.

Schauffele, Carl N.: *See—*
Bradley, John J.; Schauffele, Carl N.; and St. Clair, John Q., II, 3,723,650.

Schecker, Hans-Georg: *See—*
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, 3,723,555.

Scheer, Kurt, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Device for producing bearing traces in direction finding apparatus. 3,723,953, Cl. 340-3.00r.

Scheer, Martin: *See—*
Brockmann, Hans; and Scheer, Martin, 3,723,411.

Scheffee, Robert S., to Susquehanna Corporation, The. Gas generating composition with polyvinyl chloride binder. 3,723,205, Cl. 149-19.000.
Scheiber, Robert: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.
Scheinderman, Abraham; Rudzitis, Karl; Brandsdorfer, Arthur; and Wechsler, George. Motion picture projector means. 3,722,774, Cl. 226-62.000.
Scheinpflug, Hans; Kuhle, Engelbert; Klauke, Erich; Frohberger, Paul-Ernst; and Grewe, Ferdinand, to Farbenfabriken Bayer Aktiengesellschaft. (N-Trihalomethylthio-N-trifluoromethyl-amino)-benzamides as fungicidal agents. 3,723,628, Cl. 424-324.000.
Schenck, Leslie M.: *See—*
Eiseman, Fred S., Jr.; Schenck, Leslie M.; and Beiswanger, John P. G., 3,723,578.
Schenk, Hendrik: *See—*
Jacobus, Johannes; Schats, Cornelis; and Schenk, Hendrik, 3,723,355.
Scher, Herbert I.; and Ungar, Israel S., to Esso Research and Engineering Company. High pressure laminates with deeply embossed surface. 3,723,220, Cl. 156-219.000.
Scherb, Helmut: *See—*
Kohler, H. Dieter; Schnuchel, Gunther; and Scherb, Helmut, 3,723,551.
Schering A.G.: *See—*
Laurent, Henry; Wiechert, Rudolf; and Kolb, Karl Heinz, 3,723,484.
Schering Aktiengesellschaft: *See—*
Eder, Ulrich; and Sauer, Gerhard, 3,723,471.
Schering Corporation: *See—*
Steinman, Martin, 3,723,414.
Scherm, Arthur; and Peteri, Dezso, to Merz & Co. Chemische Fabrik. α-Halophenoxy-isobutyroyl-β-nictinoyl-clycols and processes therefor. 3,723,446, Cl. 260-295.50r.
Schiesterl, Gerhard, to Daimler-Benz Aktiengesellschaft. Steering lock for motor vehicles. 3,722,243, Cl. 70-369.000.
Schill, John E.: *See—*
Shane, Hugh J. S.; Schill, John E.; and Lilley, John W., 3,723,342.
Schinzel, Fidelius; and Schwannecke, Helmut, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Sewing machine with multi-needle supporting arm. 3,722,438, Cl. 112-199.000.
Schiptsova, Antonina Vasilievna: *See—*
Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler, Andrei Maximilianovich; and Vishnyak, Idal Aizikovich, 3,722,204.
Schlapp, Werner; and Boss, Otto, to Leitz, Ernst, G.m.b.H. Extension tube for photographic lenses. 3,722,390, Cl. 95-45.000.
Schlatter, Benjamin G.; and Spate, Sydney, to Art Iron, Inc. Portable jail cell. 3,722,152, Cl. 52-79.000.
Schlatter, Rene, to Latrobe Steel Company. Electroflux slags and methods of electroflux remelting. 3,723,094, Cl. 75-12.000.
Schlatter, Rudolph; and Adams, Charles De Witt, to Du Pont de Nemours, E. I., and Company. Salts of cyanocarbamates. 3,723,505, Cl. 260-482.00c.
Schleicher, Harold E., to Arrow-Hart, Inc. Grounding means for mounting bridges of attachment plug receptacles and the like. 3,723,939, Cl. 339-14.00r.
Schlenker, Juergen; and Wang, Teh Po, to Driver, Wilbur B., Co. Magnetic alloy. 3,723,106, Cl. 75-170.000.
Schlicker, Herman L. Pallet valve construction. 3,722,347, Cl. 84-342.000.
Schlitt, William J., III: *See—*
Spedden, Henry Rush; Richards Kenneth J.; and Schlitt, William J., III, 3,723,598.
Schloemann Aktiengesellschaft: *See—*
Buschmann, Horst, 3,722,709.
Schmerling, Louis, to Universal Oil Products Company. 9-Benzyl or 9-halobenzyl-penta halo-octahydro-5,8-methanonaphthalene-2, 3-dicarboxylic acid or anhydride. 3,723,473, Cl. 260-346.600.
Schmidgall, Hartzell H. Spring wire spacer, especially for spacing reenforcing mesh from the form in the manufacture of concrete structures and the like. 3,722,164, Cl. 52-684.000.
Schmidt, Donald L.: *See—*
Hatch, Melvin J.; Yoshimine, Masao; Smith, Hugh B.; and Schmidt, Donald L., 3,723,386.
Schmidt, Henry, Jr., to Industrial Filter & Pump Mfg., Co. Fluid feed conduit for processing apparatus. 3,722,539, Cl. 137-590.000.
Schmidt, Joseph; and Heppes, Aladar, to Magna Battery Reflector Corporation. Illuminating device for display frame. 3,723,720, Cl. 240-2.00r.
Schmidt, Karl-Walter: *See—*
Hartmann, Hans Otto; and Schmidt, Karl-Walter, 3,722,493.
Schmiedecke, Werner, to Arbeitsstelle fur Molekularelektronik. Method for the production of masks in the manufacture of semiconductor component. 3,723,277, Cl. 204-192.000.
Schmit, Joseph L.: *See—*
Kruse, Paul W.; and Schmit, Joseph L., 3,723,190.
Schmitt, Karl; and Gude, Fritz, to Scholven-Chemie AG. Process for the polymerization of olifins. 3,723,350, Cl. 252-429.00c.
Schmitz, Joseph F., to Whirlpool Corporation. Foot pedal operated adjustable rug nozzle for vacuum cleaner. 3,722,024, Cl. 15-339.000.
Schneider, Jos., & Co. Optische Werke: *See—*
Kirstein, Lothar, 3,722,547.
Schneider Metal Manufacturing Co.: *See—*
Esser, Harold Herman; and Olson, Ralph Brent, 3,722,227.
Schnellmann, Oskar, to Gretag Aktiengesellschaft. Apparatus for opening film cassettes. 3,722,768, Cl. 225-105.000.
Schnitzler, Albrecht, Jr., to Metabowerke KG Closs, Rauch & Schinizler. Electromotor. 3,723,781, Cl. 310-51.000.
Schnoring, Hildegard: *See—*
Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, 3,723,609.
Schnuchel, Gunther: *See—*
Kohler, H. Dieter; Schnuchel, Gunther; and Scherb, Helmut, 3,723,551.
Schober, Engelbert. Method of mass-producing skis and an apparatus therefor. 3,722,563, Cl. 144-317.000.
Schober, Horst A.: *See—*
Hoppmann, Kurt H.; and Schober, Horst A., 3,722,674.
Schoenbrod, Michael P., to Aircheck, Inc. Sliding panel roller assembly. 3,722,028, Cl. 16-91.000.
Scholven-Chemie AG: *See—*
Schmitt, Karl; and Gude, Fritz, 3,723,350.
Scholz, John W.: *See—*
Parker, Jerry W.; Scholz, John W.; and Mitchell, Kenneth E., 3,722,186.
Schon, Nikolaus: *See—*
Leontaritis, Lambis; Schon, Nikolaus; and Hoffmann, Hans, 3,723,162.
Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, 3,723,609.
Schonfeldt, Nikolaus Augustin, to MK Research and Development Co. Method of treating textile fibers prior to forming them into yarn. 3,723,173, Cl. 117-139.5cq.
Schouten, Gerrit Hilbertus, to U.S. Philips Corporation. Storage device for the storage of word-organized information. 3,723,984, Cl. 340-174.0rc.
Schubert, Karl P., to Acme-Cleveland Corporation. Spindle control. 3,722,048, Cl. 29-37.000.
Schubert, Karl P., to Acme-Cleveland Corporation. Stock stop in multiple spindle machine. 3,722,334, Cl. 82-34.00a.
Schuhmacher, Alfred, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2,2'-Diacylamino-1,1'-dianthraquinonyls. 3,723,479, Cl. 260-368.000.
Schull Construction Co.: *See—*
Voelsch, Delwin F., 3,722,555.
Schulte Elte, Karl Heinrich: *See—*
Ohloff, Gunther; and Schulte Elte, Karl Heinrich, 3,723,478.
Schulte-Elte, Karl-Heinrich, to Firmenich & Cie. Production of 4-5 epoxy-2-pentenal from cyclopentadiene using actinic light. 3,723,271, Cl. 204-162.00r.
Schultz, Edward H., Jr., to Nagel-Chase Manufacturing Company, The. Pulley device. 3,722,310, Cl. 74-230.800.
Schulz, Gerhard: *See—*
Goetze, Walter; Wolf, Peter; Schulz, Gerhard; and Luedemann, Horst, 3,723,530.
Matthias, Guenther; Kasper, Werner; and Schulz, Gerhard, 3,723,509.
Schulz, Raymond A., to United States of America, Navy. Temperature compensated zener diode circuit. 3,723,776, Cl. 307-318.000.
Schulze, Edwald: *See—*
Wentzel, Peter; and Schulze, Edwald, 3,723,862.
Schumacher, Gerald F., to Minnesota Mining and Manufacturing Company. Process for sealing a surface and resultant surface. 3,723,163, Cl. 117-72.000.
Schumacher, Walter C.; and Cressman, Robert C. Mountable spring wire grounding clip. 3,723,941, Cl. 339-14.00r.
Schuman, Albert. Concrete cutting hand saw. 3,722,496, Cl. 125-13.000.
Schuster, Ludwig; and Oster, Rudolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of trimethyl hydroquinone. 3,723,541, Cl. 260-621.00h.
Schwannecke, Helmut: *See—*
Schinzel, Fidelius; and Schwannecke, Helmut, 3,722,438.
Schwardt, David N.: *See—*
D'Ercole, Anthony C.; Ferris, James E.; and Schwardt, David N., 3,722,055.
Schwartz, George F.: *See—*
Hofmann, Gottfried; and Schwartz, George F., 3,722,575.
Schwartz, Hermann, to Peyer, Siegfried. Oversize filament thickness detector, particularly excessive thread thickness and knot detector for yarns. 3,723,991, Cl. 340-259.000.
Schwartz, Ira: *See—*
Stanley, Robert K.; and Schwartz, Ira, 3,722,042.
Schwarzkopf Development Corporation: *See—*
Benesovsky, Friedrich, 3,723,076.
Schweicher, Wolfgang: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Frenken, Hans; Friedsam, Josef; and Schweicher, Wolfgang, 3,723,343.
Schweizer, Herman, to Stiefelmayer, C., KG. Implement for measuring or marking workpieces. 3,722,842, Cl. 248-124.000.
Schwenk, Kurt, to Volkswagenwerk Aktiengesellschaft. Shock absorbing device especially for vehicles. 3,722,876, Cl. 267-140.000.
Scientific Drilling Controls: *See—*
Isham, Carroll E., 3,722,605.
Scientific Tube, Inc., mesne: *See—*
Brunken, Walter R., 3,722,248.
Scoggin, Barry A.: *See—*

Knell, Harvey A.; Olthoff, James A.; Scoggin, Barry A.; and Smith, Roger M., 3,722,114.
Scott, Fremont L.: *See—*
Althouse, Harlan E.; Scott, Fremont L.; and Cole, Gordon E., Jr., 3,723,379.
Scott, James; and McDowell, John S., Jr., to United Brands Company. Ship refrigeration. 3,722,230, Cl. 62-200.000.
Scovil, Henry Evelyn Derrick: *See—*
Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, 3,723,716.
Scovill Manufacturing Company: *See—*
Cole, Joseph E., 3,722,399.
Scoville, Andrew E.: *See—*
Ambler, E. Curtis; Scoville, Andrew E.; and Bush, Walter R., 3,723,815.
Seaborn, George C., Jr. Emergency distress signaling system. 3,723,876, Cl. 325-15.000.
Searle, G. D., & Co.: *See—*
Hammer, Frank E., 3,723,579.
Sears, Paul G.; and Vandersall, Howard L., to Monsanto Company. Ammonium polyphosphate materials and processes for preparing the same. 3,723,074, Cl. 423-307.000.
Sebastian, Paul J. Developing and washing tray. 3,722,394, Cl. 95-95.000.
Sebel Limited: *See—*
Rey, Ivor Allan; and Krout, Victor Edmund, 3,722,954.
Sebesta, George J.; and Mellen, Arthur J., Jr., to Dyna Magnetic Devices, Inc. Head contact microphone system. 3,723,670, Cl. 179-156.000.
Sedwell, Alfred James, to General Engineering Company. Seal. 3,722,899, Cl. 277-237.000.
Seecamp, Louis W. Combined single and double action firing mechanisms for pistols and kits for converting single-action pistols. 3,722,358, Cl. 89-147.000.
Seefluth, Uwe C. Wing for toy airplanes, particularly helicopters. 3,722,132, Cl. 46-75.000.
Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Quadrature hybrid coupler using one-port, linear circuit elements. 3,723,913, Cl. 333-11.000.
Seidel, William B., to Cincinnati Milacron, Inc. Machine tool. 3,722,711, Cl. 214-1.0bd.
Seifer, Maurice I.: *See—*
Rossell, Gary L.; Fleisher, Paul C., Jr.; and Seifer, Maurice I., 3,722,000.
Seifert, Peter, to Black Clawson Company, The. Pulping apparatus. 3,722,832, Cl. 259-44.000.
Seiple, Ronald L.; Ashenden, Edward A.; and Webb, Robert L., to United States of America, Navy. Marine mammal underwater attachment and recovery tool. 3,722,941, Cl. 294-66.00r.
Seitzer, Walter H., to Sun Research and Development Co. Stabilization of coal. 3,723,079, Cl. 44-1.00r.
Seitzer, Walter H., to Sun Research and Development Co. Hydrogenation with a Y type zeolite-arsenic catalyst. 3,723,298, Cl. 208-143.000.
Seitzer, Walter H., to Sun Research and Development Co. Hydrogenation process. 3,723,299, Cl. 208-143.000.
Sekiguchi, Tunehisa: *See—*
Hamada, Arinobu; Ohnishi, Yuuji; and Sekiguchi, Tunehisa, 3,723,209.
Sekiwa, Tetuo: *See—*
Toyama, Masaharu; and Sekiwa, Tetuo, 3,723,177.
Select-Au-Matic; a partnership composed of Dyna-Craft, Inc.: *See—*
Johnson, Frank J.; Walker, Nelson L.; and Ross, John P., 3,723,283.
Seliger, Robert L.; and Wilson, Robert G., to Hughes Aircraft Company. Stigmatic, crossed-field velocity filter. 3,723,733, Cl. 250-49.50t.
Selm, Gerald J.: *See—*
Gregerson, David A.; and Selm, Gerald J., 3,722,537.
Semeniak, Nicholas W.: *See—*
Matthews, Ralph W.; and Semeniak, Nicholas W., 3,722,542.
Semeniw, Orest T.: *See—*
Maclaine, Ian A.; and Semeniw, Orest T., 3,723,576.
Semenoff, Arnold: *See—*
Tobinick, Sidney; and Semenoff, Arnold, 3,722,012.
Semi, Inc.; Trustee in Bankruptcy for Semiconductor Electronic Momories, Inc.: *See—*
Myers, Charles F.; and Platter, Sandford (said Platter assor. to), 3,723,053.
Senju Metal Industry Co., Ltd.: *See—*
Tanaka, Jun; Taguchi, Toshihiko; and Watanabe, Mikio, 3,723,160.
Sennefelder, Anton: *See—*
Gerke, Peter; Bock, Helmuth-Joachim; and Sennefelder, Anton, 3,723,660.
Seragnoli, Ariosto, to G.D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Device for automatically varying the the operating speed in packaging machines for cigarettes. 3,722,172, Cl. 53-54.000.
Sergeenkov, Boris Nikolaevich: *See—*
Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, 3,723,853.
Sesto, Louis J., to Photo Plastic International. Picture frame assembly. 3,722,122, Cl. 40-152.000.
Seulen, Gerhard; and Reinke, Friedhelm, to AEG-Elotherm GmbH. Method of straightening elongate inductively heated workpieces. 3,723,198, Cl. 148-131.000.
Shade, Ross A.: *See—*
Barone, Larry F., Jr.; Patterson, Paul E.; and Shade, Ross A., 3,723,987.
Shaff, Arthur R.: *See—*
Borer, Herbert W.; and Shaff, Arthur R., 3,722,864.
Shaffer, Howard R.; and Strobel, Albert, to I-T-E Imperial Corporation. Shunt trip and undervoltage device. 3,723,924, Cl. 335-169.000.
Shaffer, S. Ralph, to Arrowhead Engineering Corporation. Multiple groove sheave. 3,722,309, Cl. 74-230.800.
Shaltis, Robert J.; and Woltjer, David, to Hasting Manufacturing Company. Fluid filter device. 3,722,683, Cl. 210-132.000.
Shames, Harold; Shames, Sidney J.; and Logan, John F., said Logan assor. to Melard Manufacturing Corporation. Shuttle-type diverter valve for with handle-controlled spray. 3,722,800, Cl. 239-447.000.
Shames, Sidney J.: *See—*
Shames, Harold; Shames, Sidney J.; and Logan, John F., 3,722,800.
Shane, Hugh J. S.; Schill, John E.; and Lilley, John W., to Hart Chemical Limited. Defoamer composition. 3,723,342, Cl. 252-358.000.
Shapiro, Aron Isaakovich: *See—*
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich, Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.
Sharp and Company Limited: *See—*
Flory, Brian Allen; and Geldard, Roger Michael, 3,723,011.
Sharp, Denis, to U.S. Philips Corporation. Electrical circuit arrangements for converting a variable rate of pulse transmission into a related electrical output quantity. 3,723,764, Cl. 307-233.000.
Sharp, Jonathan E.: *See—*
Frost, Richard H.; Maguire, John; and Sharp, Jonathan E., 3,723,036.
Shaw, Frank Derek: *See—*
Gunnell, Geoffrey Herbert Arthur; and Shaw, Frank Derek, 3,722,269.
Shaw, Fred D., Jr. Trimerized crude isocyanate mixtures and polyurethane foams prepared from same. 3,723,363, Cl. 260-2.5aw.
Sheahan, Desmond F.; and Callander, George C., to GTE Automatic Electric Laboratories Incorporated. Crystal filter assembly. 3,723,920, Cl. 333-72.000.
Sheehan, John T.: *See—*
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,723,406.
Sheflin, Bob W. Detergent composition. 3,723,330, Cl. 252-153.000.
Shekerjian, Hart; and Oulman, Stanley R., to Motorola, Inc. High power semiconductor device included in a standard outline housing. 3,723,836, Cl. 317-234.00r.
Shell Oil Company: *See—*
Bauer, Ronald S.; and Holler, Howard V., 3,723,591.
Newey, Herbert A.; and Holler, Howard V., 3,723,361.
Shepherd, Denis, to Kidde, Walter, & Company, Inc. Method for foam generation. 3,723,340, Cl. 252-307.000.
Sherain, Monroe B.: *See—*
Fischer, Leonard G.; Sherain, Monroe B.; Cornacchio, Nancy A.; Entner, Bernard J.; and Pettinato, Ferdinand E., 3,723,137.
Sheratte, Martin B.: *See—*
McCord, Robert S.; Nail, Donald H.; and Sheratte, Martin B., 3,723,319.
Sheremet, Nilolai Andreevich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.
Sherwin-Williams Company, The: *See—*
Wise, Lowell G., 3,723,274.
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, to Showa Denko Kabushiki Kaisha. Process for the continuous production of aluminum. 3,723,093, Cl. 75-10.00r.
Shibata, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for forcibly closing an engine throttle valve. 3,722,492, Cl. 123-198.000.
Shida, Atsuo: *See—*
Suwa, Koichiro; Satoh, Haruki; and Shida, Atsuo, 3,722,516.
Shigematsu, Hiroshi: *See—*
Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, 3,723,222.
Shimano, Akira: *See—*
Haruna, Takashi; and Shimano, Akira, 3,723,681.
Shimizu, Akihiko: *See—*
Inoue, Kiyoshi; and Shimizu, Akihiko, 3,722,833.
Shimoda, Seisuke; and Shimoda, Yoshiaki, to Toho Machine Co., Ltd. Pickup of disk reproducer. 3,722,893, Cl. 274-23.00r.
Shimoda, Yoshiaki: *See—*
Shimoda, Seisuke; and Shimoda, Yoshiaki, 3,722,893.
Shiner, Leo E. Method of making rope figure. 3,722,070, Cl. 29-433.000.
Shiono, Ryuji: *See—*
Kubota, Yasuhare; and Shiono, Ryuji, 3,723,639.
Shishido, Tadao: *See—*

Hayashi, Jun; Ohi, Reiichi; Shishido, Tadao; and Kondo, Tokiharu, 3,723,125.
Showa Denko Kabushiki Kaisha: *See—*
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, 3,723,093.
Showa Denko K.K.: *See—*
Hamada, Arinobu; Ohnishi, Yuuji; and Sekiguchi, Tunehisa, 3,723,209.
Shuleshko, Paul, to Sybron Corporation. System having fast plural high voltage switching. 3,723,855, Cl. 323-21.000.
Shumway, Durland K.: *See—*
Kenkare, Divaker B.; and Shumway, Durland K., 3,722,752.
Shur-Lok Corporation: *See—*
Wright, George H.; and Phelan, Charles S., 3,722,671.
Shuster, Yan: *See—*
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.
Siddall, John B.: *See—*
Diekman, John D.; and Siddall, John B., 3,723,447.
Siddall, John B.; and Henrick, Clive A., to Zoecon Corporation. Epithio Dienoates. 3,723,462, Cl. 260-327.00e.
Siddall, John B.; and Hendrick, Clive A., to Zoecon Corporation. Sesamalyl ethers and thioethers. 3,723,467, Cl. 260-340.500.
Siemens Aktiengesellschaft: *See—*
Frei, Gerhard; and Hintergraber, Maximillian, 3,722,578.
Gerke, Peter; Bock, Helmuth-Joachim; and Sennefelder, Anton, 3,723,660.
Jentges, Heribert; and Burz, Oskar, 3,722,872.
Krause, Heinz, 3,723,918.
Michel, Eberhard, 3,722,479.
Muller, Edwin, 3,722,107.
Muller, Henrik, 3,723,657.
Sohlbarand, Heinrich, 3,723,178.
Storck, Eckhard; and Ost, Joachim, 3,723,012.
Thurk, Gerhard; and Beier, Helmut, 3,723,685.
Wentzel, Peter; and Schulze, Edwald, 3,723,862.
Sievenpiper, Ward, to Automatic Sprinkler Corporation. Synthetic plastic sleeve bearing having improved heat transfer characteristics. 3,722,375, Cl. 92-168.000.
Signetics Corporation: *See—*
Beyerlein, Fritz W., 3,722,072.
Signode Corporation: *See—*
Meier, William A.; and Wojcik, Edward P., 3,722,669.
Plunkett, Larry D., 3,722,670.
Sill, James E.: *See—*
Goya, Tamotsu; and Sill, James E., 3,721,999.
Silverthorne, John D. Cautery apparatus. 3,723,704, Cl. 219-242.000.
Silvester, Richard. Thrust augmenter. 3,722,454, Cl. 115-34.00r.
Simmler, Walter: *See—*
Moller, Friedrich; Roegler, Manfred; Simmler, Walter; and De Montigny, Armand, 3,723,492.
Simon, Raphael A.: *See—*
Knowles, Daniel H.; Lapinsky, George D.; Overman, Kenneth T.; and Simon, Raphael A., 3,723,082.
Singer Company, The: *See—*
Bose, Norman J.; and Brown, Alexander S., 3,723,669.
Chen, Wei L.; and Carter, John R., 3,723,719.
Hill, George Edward; and Tomlin, Bruce Warren, 3,722,536.
Newman, Albert L., 3,722,439.
Singer Company, The, mesne: *See—*
Witteles, Abraham A., 3,723,873.
Singer, Frederick W., to International Business Machines Corporation. Semi-automatic form loading for printers. 3,722,655, Cl. 197-133.000.
Sinner, George A., to Teammakers, Inc. Movable stand for a basketball goal. 3,722,886, Cl. 273-1.50r.
Siravo, Ernest D.: *See—*
Parker, Norman E.; and Siravo, Ernest D., 3,722,648.
Sirota, Vladimir Andreevich: *See—*
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.
Sitar, Clement P., to Furnas Electric Company. Bimetallic circuit overload protector. 3,723,929, Cl. 337-38.000.
Sjostrom, John Olov Hilding; and Sundkvist, Lars Erik, to AB Hagglund & Soner. Container handling device for yoke-end trucks or the like. 3,722,720, Cl. 214-317.000.
Skarbo, Roald R., to Kennecott Copper Corporation. Extraction of copper and nickel from manganese nodules. 3,723,095, Cl. 75-21.000.
SKF Kugellagerfabriken Gesellschaft mit beschrankter Haftung: *See—*
Fuchs, Franz, 3,722,036.
Ski Valet, Inc.: *See—*
Busch, Paul F.; and Krumme, John F., 3,722,652.
Skinner, Stanley John: *See—*
Foster, William Rees; and Skinner, Stanley John, 3,723,586.
Skochdopole, Richard E.; and Denslow, Keith R., to Dow Chemical Company, The. Asymmetrically foamable strand. 3,723,240, Cl. 161-173.000.
Skubic, Leroy F., to Paltier Corporation, The. Panel retainer for portable tiering rack. 3,722,928, Cl. 287-20.924.
Skurnia, Uwe; and Rohlfs, Hans, to Chemische Werke Albert. Preparation of fluorophosphates. 3,723,603, Cl. 423-307.00r.
Sletzinger, Meyer: *See—*
Reinhold, Donald F.; Sletzinger, Meyer; and Chemerda, John M., 3,723,496.
Slevin, James T. Mechanical ball throwing device. 3,722,494, Cl. 124-7.000.
Slingerland Drum Co.: *See—*
Hoellerich, John L., 3,722,349.
Sloane, Howard J., to Beckman Instruments, Inc. Optical scattering filter. 3,722,977, Cl. 350-1.000.
Sloane, Howard J.; and Keahl, Gerald T., to Beckman Instruments, Inc. Optical scattering filter with hygroscopic material. 3,722,978, Cl. 350-1.000.
Small World Importing Corporation: *See—*
Lerner, Charlotte F., 3,723,723.
Smekens, Jan C. Tire chain applicator. 3,722,330, Cl. 81-15.800.
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne. Well production testing and flow characteristic evaluation methods using small diameter tubing. 3,722,589, Cl. 166-250.000.
Smith, Arthur W.; Plummer, Ray A.; and Johnson, Charles Wayne. Well methods using small diameter tubing. 3,722,594, Cl. 166-305.00r.
Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Process for the preparation of 1-halophospholenes. 3,723,520, Cl. 260-543.00p.
Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Process for the preparation of 1-halophospholenes. 3,723,521, Cl. 260-543.00p.
Smith, Frank R. Hemodialysis apparatus. 3,722,680, Cl. 210-96.000.
Smith, Garth R.: *See—*
Holt, Jan D.; and Smith, Garth R., 3,722,429.
Smith, Gene K.; and Tye, Gene, to General Electric Company. Wide angle sighting apparatus. 3,723,005, Cl. 356-29.000.
Smith, George T., to Western Electric Company, Incorporated. Double-sided flexible circuit assembly and method of manufacture therefor. 3,723,635, Cl. 174-68.500.
Smith, Glenn H.: *See—*
Kuriz, Hobart L., Jr.; Smith, Glenn H.; and Wolff, Charles H., 3,723,975.
Smith, Hugh B.: *See—*
Hatch, Melvin J.; Yoshimine, Masao; Smith, Hugh B.; and Schmidt, Donald L., 3,723,386.
Smith, James S.: *See—*
Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D., 3,723,792.
Smith Kline & French Laboratories: *See—*
Ederton, William H., 3,723,526.
Kaiser, Carl; and Zirkle, Charles L., 3,723,441.
Sutton, Blaine M., 3,723,617.
Smith, Lawrence J.: *See—*
Zucker, Fredric E.; Murphy, James P.; Smith, Lawrence J.; and Kaswer, Joseph, Jr., 3,723,655.
Smith, Robert G. Tether assembly. 3,722,478, Cl. 119-120.000.
Smith, Roger M.: *See—*
Knell, Harvey A.; Olthoff, James A.; Scoggin, Barry A.; and Smith, Roger M., 3,722,114.
Smith, Russell T. Control of refrigerant migration to compressor during shutdown. 3,722,228, Cl. 62-206.000.
Smith, Tom E., to Jaybee Manufacturing Corporation. Self-latching hinge. 3,722,030, Cl. 16-142.000.
Smoot-Holman Company: *See—*
Jones, Bill F., 3,723,808.
Snarey, Michael: *See—*
Augstein, Joachim; Ham, Allan L.; Leeming, Peter R.; and Snarey, Michael, 3,723,524.
Snead, Edwin Des. Weighing apparatus. 3,722,660, Cl. 198-39.000.
Snyder, Larry L.; and Matlack, James R., to Jarva, Inc. Gage scraper. 3,722,957, Cl. 299-86.000.
Sobecki, Zygmunt: *See—*
Leonard, Gordon Harris; Sobecki, Zygmunt; and Lomas, Peter Robert, 3,723,817.
Societe Anonyme D.B.A.: *See—*
Durand, Philippe, 3,722,364.
Societe Anonyme dite: Orsymonde: *See—*
Lafon, Louis, 3,723,527.
Societe Anonyme Francaise Eternit: *See—*
Blary, Auguste, 3,723,245.
Societe Anonyme Gambin S.A.: *See—*
Rinck, Albert, 3,722,361.
Societe Civile Auguil: *See—*
Dvolaitzky, Frajda; and Cognacq, Jean-Claude, 3,723,420.
Societe des Aciers Fins de l'Est: *See—*
Knierim, Henri, 3,722,712.
Societe d'Etudes de Machines Thermiques: *See—*
Kuhn, Karl, 3,722,210.
Societe d'Etudes de Recherches et d'Applications Scientifiques et Medicales E.R.A. S.M.E.: *See—*
Gradnik, Boris; Pedrazzoli, Andrea; and Dall'Asta, Leone, 3,723,453.
Societe d'Etudes Scientifiques et Industrielles de L'Ile-de'France: *See—*

Thominet, Michel Leon, 3,723,416.
Societe d'Exploitation des Brevets Neiman: *See*—
Lipchutz, Paul, 3,722,242.
Societe en nom Collectif "Science Union et Cie, Societe Francaise de Recherche Medicale": *See*—
Malen, Charles; Desnos, Monique; and Poignant, Jean-Claude, 3,723,466.
Societe Generale des Produits Refractaires: *See*—
Herzberg, Claude, 3,722,866.
Societe National Industrielle Aerospatiale: *See*—
Rouyer, Georges, 3,722,247.
Societe Nationale des Petroles D'Aquitaine: *See*—
Amiard, Yves; Bellissent, Jean-Paul; and Marie, Gilbert, 3,723,399.
Soderlund, Gary: *See*—
Koch, Ulrich H.; Matousek, Stephen; and Soderlund, Gary, 3,722,856.
Sohlbarand, Heinrich, to Siemens Aktiengesellschaft. Process for producing contact metal layers consisting of chromium or molybdenum on semiconductor components. 3,723,178, Cl. 117-227.000.
Sokolov, Boris Ivanovich: *See*—
Levlya, Andrei Dmitrievich; Kazakevich, Igor Illarionovich; Gribalev, Nilolai Ivanovich; Lozhkin, Vladimir Mikhailovich; Sokolov, Boris Ivanovich; Safronov, Sergei Fedorovich; Moroziv, Evgeny Vasilievich; Sirota, Vladimir Andreevich; Mitkin, Vladimir Andrevich; Kozhin, Nikolai Ivanovich; and Bratus, Anatoly Dmitrievich, 3,723,860.
Solarn Mfg., Co., Inc.: *See*—
Arnett, Wayne E.; and Solomon, Cyril P., 3,722,686.
Solomon, Archie. Collapsible transporter for garments and the like. 3,722,905, Cl. 280-39.000.
Solomon, Cyril P.: *See*—
Arnett, Wayne E.; and Solomon, Cyril P., 3,722,686.
Solvay & Cie: *See*—
Lecuit, Paul; and Demilie, Paul, 3,723,596.
Sommer, G. M., Co., Inc.: *See*—
Sommer, Gordon M., 3,722,645.
Sommer, Gordon M., to Sommer, G. M., Co., Inc. Clutch unit. 3,722,645, Cl. 192-70.130.
Sone, Hitoshi, to Kabushiki Kaisha Ricoh. Automatic exposure control for contact exposure photocopying machine. 3,723,000, Cl. 355-83.000.
Song, John, to American Cyanamid Company. Hindered tris(meta-hydroxybenzylthio)-S-triazine antioxidants. 3,723,428, Cl. 260-248.0cs.
Sony Corporation: *See*—
Kubota, Yasuhare; and Shiono, Ryuji, 3,723,639.
Sordello, Frank J., to Information Storage Systems, Inc. Peak detector. 3,723,766, Cl. 307-235.00a.
Sorenson, Charles E.; and Stubblefield, Clyde D., to Hahn, Inc. Foot pedal transmission control. 3,722,314, Cl. 74-512.000.
Sost, Rolf: *See*—
Heinrich, Frank-Armin; Prause, Dieter; and Sost, Rolf, 3,723,641.
Souda, Shigeru: *See*—
Hirose, Horiyasu; and Souda, Shigeru, 3,723,457.
South African Sugar Association: *See*—
Alexander, John Briar, 3,723,179.
Southern Cross Industries, Inc.: *See*—
Barrineau, Wade H.; and Osborne, Anthony, 3,722,766.
Southwire Company: *See*—
Armstrong, Robert T., 3,722,077.
Southworth, Edward A.: *See*—
Hart, Harold W.; and Southworth, Edward A., 3,722,664.
Soyland, Ingebret; and Soyland, Kristian. Effect regulator for constant and variable volume-flow pumps. 3,723,026, Cl. 417-286.000.
Soyland, Kristian: *See*—
Soyland, Ingebret; and Soyland, Kristian, 3,723,026.
Spaeder, Gerald J.: *See*—
Murphy, William J.; and Spaeder, Gerald J., 3,723,196.
Spain, Roy C.; and Oliver, Roy N. Cylinder lock. 3,722,240, Cl. 70-364.00a.
Spangler, Myrtle Joanne, to Dan River Inc. Process of reducing formaldehyde odor of aqueous mixtures containing methylolated carbamates. 3,723,377, Cl. 260-29.40r.
Spate, Sydney: *See*—
Schlatter, Benjamin G.; and Spate, Sydney, 3,722,152.
Spedden, Henry Rush, to Kennecott Copper Corporation. Process for recovering volatilized rhenium oxides and sulfur oxides from gas streams. 3,723,595, Cl. 423-50.000.
Spedden, Henry Rush; Richards Kenneth J.; and Schlitt, William J., III, to Kennecott Copper Corporation. Dry cyclic process utilizing a maganous oxide absorbent for removal of dilute sulfur values from gas streams. 3,723,598, Cl. 423-244.000.
Speed-O-Print Business Machines Corporation: *See*—
Samuels, Abe, 3,722,050.
Speiser, Jeffrey M.; and Whitehouse, Harper John, to United States of America, Navy. Surface wave multiplex transducer device with gain and side lobe suppression. 3,723,916, Cl. 333-30.000.
Spelha, David J.; and Kreuser, Marvin J., to Nuclear-Chicago Corporation. Radiation detecting apparatus. 3,723,735, Cl. 250-71.50r.
Spencer, Duane Robert, to United States of America, Navy. Variable area injector for rocket engine. 3,722,219, Cl. 60-39.74a.
Speranza, George Phillip; and Moss, Philip Hotchkiss, to Jefferson Chemical Company, Inc. One shot rigid foams from sucrose polyols. 3,723,365, Cl. 260-2.5as.
Sperberg, Lawrence R. Non-destructive method of determining tire life. 3,722,270, Cl. 73-146.000.
Sperry Rand Corporation: *See*—
Campbell, Willis R.; and Brackbill, Warren H., 3,722,306.
Campbell, Willis R., 3,722,307.
Dixon, Harold G.; and Ferrekk, Harold M., 3,723,750.
Duncan, Damon H.; and Jacobson, Peter E., 3,722,297.
Granberg, Mauritz; and Mueller, Hubert W., Jr., 3,723,802.
Halls, Lawrence M., 3,722,194.
Hurlburt, Joseph C., 3,722,195.
Miska, Aivars, 3,722,927.
Nolt, Edwin B.; and McIlwain, Irwin D., 3,722,934.
Passarelli, William O., Jr., 3,722,295.
Spiegelberg, Hans: *See*—
Edenhofer, Albrecht; and Spiegelberg, Hans, 3,723,445.
Spiess, Karl, to Industriewerk Schaeffer OHG. Apparatus and method for assembling universal joints. 3,722,066, Cl. 29-271.000.
Spillson, George A.: *See*—
Page, William H.; and Spillson, George A., 3,722,781.
Spisak, Andrew J.; and Nagoda, Louis E., to Westinghouse Electric Corporation. Rectifier assembly for brushless excitation systems. 3,723,794, Cl. 310-68.00d.
Spivack, John D.: *See*—
Dexter, Martin; Spivack, John D.; and Steinberg, David H., 3,723,489.
Dexter, Martin; Spivack, John D.; and Steinberg, David Herbert, 3,723,503.
Spontelli, Leonard P., to Crawford Fitting Company. Ferrule setter with indicating means. 3,722,064, Cl. 29-237.000.
Spradley, Lewis Harold: *See*—
Behane, David; Spradley, Lewis Harold; Cahill, Lysle D.; and Marshall, William W., 3,723,646.
Sprague, Lindol H.: *See*—
Wilson, Fred A.; and Sprague, Lindol H., 3,722,549.
Springer, Alois H.: *See*—
Hooper, Gilman S.; and Springer, Alois H., 3,723,055.
Springs Mills, Inc.: *See*—
Flowers, Thad T.; and Stuart, William I., 3,722,772.
Lee, Roy Leon; and Aldrop, Lanneau Frazier, 3,722,956.
Spuhl AG: *See*—
Spuhl, Walter, 3,722,056.
Spuhl, Walter, to Spuhl AG. Knot setting device in a feed mechanism for helicoidal wire springs. 3,722,056, Cl. 29-200.00a.
Square D Company: *See*—
De Viney, Terrence E., 3,723,825.
Leonard, James H., 3,723,940.
Meyer, Charles F.; Wieczorek, Robert A.; and Waters, Richard A., 3,723,767.
Squibb, E. R., & Sons, Inc.: *See*—
Haugwitz, Rudiger D.; and Narayanan, Venkatachala L., 3,723,424.
Ondetti, Miguel A.; Pluscec, Josip; Sheehan, John T.; Jorpes, Johan E.; and Mutt, Viktor, 3,723,406.
Yale, Harry L.; and Bernstein, Jack, 3,723,463.
Squibb, E. R., & Sons, Inc., mesne: *See*—
Levine, Seymour D.; and Principe, Pacifio A., 3,723,508.
Sredneaziatsky Nauchno-Issledovatelsky i Proektny Institut Tsvetnoi Metallurgii: *See*—
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, 3,723,267.
St. Clair, John Q., II: *See*—
Bradley, John J.; Schauffele, Carl N.; and St. Clair, John Q., II, 3,723,650.
Stack, Louis J. Car port oil drip mat. 3,722,626, Cl. 184-106.000.
Staheli, Paul, to Rieter Machine Works, Ltd. Method and apparatus for detecting weight variations of a sliver on spinning preparatory machines. 3,722,260, Cl. 73-37.700.
Stahl, Norman O. Surgical instrument case. 3,723,061, Cl. 21-103.000.
Stahlheber, Norman Earl, to Monsanto Company. Phosphate compositions and methods of manufacture. 3,723,602, Cl. 423-305.000.
Staley, A. E., Manufacturing Company: *See*—
Jones, Rexford W.; and Thompson, William B., 3,723,123.
Jones, Rexford W.; and Thompson, William B., 3,723,124.
Staley, Lewis E.: *See*—
Runyan, Wesley G.; and Staley, Lewis E., 3,723,871.
Stamicarbon N.V.: *See*—
Eurlings, Jacobus J. M. G.; Geus, John W.; and Weterings, Cornelis A. M., 3,723,353.
Van Koppen, Christianus W. J., 3,723,069.
Stanadyne, Inc.: *See*—
Chapuis, Marcel, 3,722,801.
Standard Concrete Pipe Company, Inc.: *See*—
Brown, Lester F., 3,723,041.
Standard Oil Company: *See*—
Branen, William T.; and Watson, Roger W., 3,723,460.
Stander, Herman: *See*—
Amrhein, Heinz G.; Stander, Herman; and Rosenow, Heinz, 3,722,145.
Stanford Research Institute: *See*—
Adams, David K.; and Ho, Raymond Y.-C., 3,723,773.
Cornsweet, Tom N., 3,723,648.
Stange, Klaus K., to Honeywell Information Systems Inc., mesne. Pneumatic accessing of tape bands. 3,723,981, Cl. 340-174.10c.

Stanley, Robert K.; and Schwartz, Ira, to Techniservice Corporation P. O. Drawer "P". Strand treatment. 3,722,042, Cl. 28-1.600.
Stanley Works, The: *See—*
Ambler, E. Curtis; Scoville, Andrew E.; and Bush, Walter R., 3,723,815.
Stansel, John C.: *See—*
Aranguren, Jorge; and Stansel, John C., 3,723,742.
Stapp, Hans: *See—*
Werner, Helmut; and Stapp, Hans, 3,723,238.
Stark, Bernard Peter: *See—*
Oswald, Richard Alan; and Stark, Bernard Peter, 3,723,559.
Stark, Martin H. Shade roller. 3,722,573, Cl. 160-326.000.
Stark, Robert E.; and Walker, Douglas W., to Gates Rubber Company, The. Compression cell closure. 3,723,184, Cl. 136-133.000.
Start, John F.; and Towns, Donald L., to FMC Corporation. Synthesis of 2,2-dimethyl-7-benzofuranol. 3,723,472, Cl. 260-346.20r.
Stas, Jozef J.: *See—*
Keijzer, Johan H.; Meuleman, Francois J. G.; Jossa, Louis J.; and Stas, Jozef J., 3,722,639.
Stauffer Chemical Company: *See—*
Baker, Don R., 3,723,626.
Fancher, Llewellyn W., 3,723,450.
Teach, Eugene G.; and Arneklev, Duane R., 3,723,474.
Stebbins, George B.; Stebbins, James F.; and Becker, John G., said Becker, John G., assor. to Rose, Edwssa H. Floating oil skimming apparatus with oil and water separator. 3,722,687, Cl. 210-219.000.
Stebbins, James F.: *See—*
Stebbins, George B.; Stebbins, James F.; and Becker, John G., 3,722,687.
Steel Company of Canada, Ltd., The: *See—*
Thumm, Wilhelm; and Nagel, Horst, 3,723,059.
Steele, Charles Sam: *See—*
Pitts, James William; and Steele, Charles Sam, 3,723,529.
Steele, Donald F., to Electro Signal Lab., Inc. Photoelectric detector with compensating photocell. 3,723,747, Cl. 250-218.000.
Stegmuller, Charles D. Method and device for straightening beams. 3,722,562, Cl. 144-309.000.
Stein, Wolfgang J., to Avco Corporation. Gas turbine engine lubrication system. 3,722,212, Cl. 60-39.080.
Steinberg, David H.: *See—*
Dexter, Martin; Spivack, John D.; and Steinberg, David H., 3,723,489.
Furia, Thomas E.; and Steinberg, David H., 3,723,435.
Steinberg, David Herbert: *See—*
Dexter, Martin; Spivack, John D.; and Steinberg, David Herbert, 3,723,503.
Steiner American Corporation: *See—*
Bahnsen, Erwin B., 3,722,232.
Steinhagen, Horst G., to Twin Disc, Incorporated. Torque limiting coupling. 3,722,644, Cl. 192-56.00r.
Steinhauer, Roger C.; Falevitch, Leonard A.; and Church, David R., to Armour-Dial, Inc. Aerosol textile sizing product and method. 3,723,376, Cl. 260-29.6hn.
Steinman, Martin, to Schering Corporation. 1-Polyfluoroalkyl benzodiazepines. 3,723,414, Cl. 260-239.0bd.
Stenberg-Flygt AB: *See—*
Dahlgren, Jens Karl Adolf, 3,722,757.
Stenstrom, Borje, to Gulf Oil Corporation. Apparatus for skimming oil. 3,722,690, Cl. 210-242.000.
Stepan Chemical Company: *See—*
Riso, Rocco R.; and Lemberg, Seymour, 3,723,542.
Stepanova, Ljudmila Nikolaevna: *See—*
Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler, Andrei Maximilianovich; and Vishnyak, Idal Aizikovich, 3,722,204.
Stephenson, John L.; and Gaven, Joseph V., Jr. Food additive composition of squalene oleyl alcohol and oleic and linoleic acid. 3,723,130, Cl. 99-2.00f.
Sterling Drug Inc.: *See—*
Diana, Guy D., 3,723,421.
Sterling Plastics Co.: *See—*
Fleming, Jack Fairchild, 3,722,796.
Sterling Radiator Company, Inc.: *See—*
Clay, Howard W., 3,723,702.
Sterling, Walter S., to Pneumatic Scale Corporation. Closure handling and orienting apparatus. 3,722,658, Cl. 198-33.0aa.
Sterner, John Franklin; and Hanchett, George Draper, to RCA Corporation. Dual-gate MOS-FET oscillator circuit with amplitude stabilization. 3,723,905, Cl. 331-109.000.
Steuer, Herbert, to Reimers Getriebe A.G. Bearing of the conical discs of an infinitely variable cone pulley transmission. 3,722,308, Cl. 74-230.17m.
Stevens, Walter Chandler, Jr.; and More, Philip M., to Universal Refrigeration, Inc. Pilot clamp and shield. 3,723,050, Cl. 431-191.000.
Stevenson, John W.; and Trask, Warren T., to Mallinckrodt Chemical Works. Manufacture of aluminum tribromide. 3,723,075, Cl. 423-495.000.
Stewart, Andrew W.; Britzman, Gilbert J.; Bauer, Dale M.; and Britzman, Bruce E., to Meridian Interprises, Inc. Retractable fountain assembly. 3,722,816, Cl. 239-17.000.
Stiefelmayer, C., KG: *See—*
Schweizer, Herman, 3,722,842.
Stiff, Bernard G.; and Finelli, Thomas M., to Avco Corporation. Method of making a radial bearing containing end-loaded filaments. 3,722,051, Cl. 29-149.500.
Stirland, Meade A.; and Kalinowski, John A., to United States of America, Atomic Energy Commission, mesne. Alignment system. 3,723,013, Cl. 356-152.000.
Stirling, John Andrew: *See—*
Inman, Eric Richard; Macpherson, Ian Alexander; and Stirling, John Andrew, 3,723,490.
Stivers, David A., to Minnesota Mining and Manufacturing Company. Fluorinated elastomer blends. 3,723,577, Cl. 260-900.000.
Stocklein, Franz, to Max-Plancek-Gesellschaft zur Forderung der Wissenschaften e.V. Electrical high voltage apparatus equipped with a movable air lick device for exchanging the filament of an electron gun. 3,723,791, Cl. 313-237.000.
Stoeckl, Ernest P., to Geneva Industries, Inc. Spring lever catch and strike cam. 3,722,937, Cl. 292-79.000.
Stoffel, James C.; and Brock, John L., to Xerox Corporation. Toner meter device. 3,722,471, Cl. 118-637.000.
Stoller, Milton, to Scan-Optics, Inc., mesne. Optical character recognition system. 3,723,970, Cl. 340-146.3ma.
Storck, Eckhard; and Ost, Joachim, to Siemens Aktiengesellschaft. Holographic alignment system. 3,723,012, Cl. 356-152.000.
Storck, Harold A. Omniological filter and process. 3,723,304, Cl. 210-11.000.
Storck, Herder; and Erhard, Werner, to Koppers-Wistra-Ofenbau Gesellschaft mit beschraenkter Haftung. Walking beam furnace. 3,722,865, Cl. 198-313.000.
Straub, Francis W.: *See—*
Sargent, John A.; and Straub, Francis W., 3,722,695.
Street, Robert W.: *See—*
Herber, John F.; Street, Robert W.; and Richard, William R., Jr., 3,723,320.
Striegler, John H.: *See—*
Kern, Loyd R.; and Striegler, John H., 3,722,609.
Strobel, Albert: *See—*
Shaffer, Howard R.; and Strobel, Albert, 3,723,924.
Strom, Sven B., to American Pulverizer Company. Grate for reduction mill. 3,722,805, Cl. 241-73.000.
Stromberg-Carlson Corporation: *See—*
Budrys, Ignas; and Lee, Ernest O., Jr., 3,723,659.
Strong, Doyle L., to Minnesota Mining and Manufacturing Company. Vapor thermographic duplicating process. 3,722,406, Cl. 101-469.000.
Strong, Jerry G.: *See—*
Tobias, Michael A.; and Strong, Jerry G., 3,723,531.
Strother, Fred P.; and Blackstone, James O., Jr., to West Point-Pepperell, Inc. Digital pattern control apparatus for textile machinery. 3,722,434, Cl. 112-79.00a.
Strouse, James L., to McKee Button Company. Garment working machine. 3,722,436, Cl. 112-121.110.
Strubbe, Gilbert J., to Clayson N.V. Automatic header height controlling machanism. 3,722,193, Cl. 56-208.000.
Struble, Glenn E., to Diamond International Corporation. Plastic container-dispenser with outer carton container. 3,722,754, Cl. 222-183.000.
Struble, Glenn E., to Diamond International Corporation. Safety cutter-edge box. 3,722,767, Cl. 225-49.000.
Stryczek, Leon K. Conveyor system for loading and unloading trucks. 3,722,717, Cl. 214-83.220.
Stuart, Clara M.: *See—*
Flank, William H.; McEvoy, James E.; and Stuart, John R., 3,723,351.
Stuart, John R.: *See—*
Flank, William H.; McEvoy, James E.; and Stuart, John R., 3,723,351.
Stuart, William I.: *See—*
Flowers, Thad T.; and Stuart, William I., 3,722,772.
Stubblefield, Clyde D.: *See—*
Sorenson, Charles E.; and Stubblefield, Clyde D., 3,722,314.
Stubert, John Wesley, to Chicago Bridge & Iron Company. Latching mechanism for access door. 3,722,936, Cl. 292-64.000.
Stuebinger, Adolf; and Mueller, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of triaryl phosphines. 3,723,536, Cl. 260-606.50p.
Stull, Charles V.: *See—*
Cuorato, John; and Stull, Charles V., 3,723,824.
Stull, Robert E. Oil cleaning apparatus. 3,722,693, Cl. 210-320.000.
Stultz, Harry, Jr.: *See—*
Beach, Richard G.; Stultz, Harry, Jr.; and Symonds, James A., 3,722,373.
Sturm, Hans-Juergen: *See—*
Armbrust, Herbert; Kilpper, Gerhard; Koehler, Waldemar; Schecker, Hans-Georg; and Sturm, Hans-Juergen, 3,723,555.
Stuttard, Leonard Wallace: *See—*
Cheng, Wai Ming; Davies, James Francis; and Stuttard, Leonard Wallace, 3,723,326.
Subramanian, Mahadevan: *See—*
Lim, Yen San; and Subramanian, Mahadevan, 3,723,744.
Suddeutsche Kalkstickstoff-Werke AG: *See—*
Prietzel, Horst, 3,723,511.
Suddeutsche Kalkstickstoff-Werke Aktiengesellschaft: *See—*
Kaess, Franz; Leinhard, Klaus; and Michaud, Horst, 3,723,549.
Sudo, Hisao: *See—*
Kosugi, Takashi; Abe, Hiroyuki; and Sudo, Hisao, 3,723,822.

Sugahara, Hirotaka: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Sugawara, Junichi: *See—*
Asou, Setsuro; Sugawara, Junichi; Tanso, Tukuhei; and Yashiro, Katsuji, 3,722,318.

Sugimoto, Masashi; and Moriyama, Yoshiki, to Nomura, Norio, mesne. Flow regulating device. 3,722,858, Cl. 251-209.000.

Sukegawa, Chosei: *See—*
Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, 3,723,645.

Suladze, Ippolit Davidovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Sulcs, Jurist; and McKimm, Robert W., to General Electric Company. Alumina ceramic lamp having heat-reflecting shields surrounding its electrodes. 3,723,784, Cl. 313-47.000.

Sullivan, James D., to Monsanto Company. Composition comprising mixtures of substituted triarylphosphates. 3,723,315, Cl. 252-49.800.

Sullivan, Norman F., to North American Rockwell Corporation. Solid-state, non-contacting thermistor electronic switch. 3,723,758, Cl. 307-117.000.

Sulzer Brothers Limited: *See—*
Juricek, Edward L., 3,723,049.

Sumitomo Chemical Company, Limited: *See—*
Okuno, Yositosi, 3,723,615.

Sumitomo Chemical Company, Ltd.: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Sumitomo Metal Industries, Ltd.: *See—*
Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, 3,722,463.
Marukawa, Katsukiyo, 3,723,099.

Sun Oil Company: *See—*
Hollstein, Elmer J.; and Brownstein, Arthur M., 3,723,436.
Kress, Rene F., 3,723,295.

Sun Oil Company of Pennsylvania: *See—*
Glessner, Alfred J.; and Wentzheimer, William Wayne, 3,723,292.
Glessner, Alfred J.; Wentzheimer, William Wayne; and Kress, Rene F., 3,723,293.

Sun Oil Company of Pennsylvania, mesne: *See—*
Campbell, Robert H.; and Cherry, Wesley R., 3,723,371.

Sun Research and Development Co.: *See—*
Seitzer, Walter H., 3,723,079.
Seitzer, Walter H., 3,723,298.
Seitzer, Walter H., 3,723,299.
Thompson, Robert M., 3,723,573.

Sunbeam Plastics Corporation: *See—*
Gach, Peter P., 3,722,727.

Sundkvist, Lars Erik: *See—*
Sjostrom, John Olov Hilding; and Sundkvist, Lars Erik, 3,722,720.

Sundstrand Corporation: *See—*
Cordner, Michael A.; and Grimm, Duane H., 3,722,324.
Reynolds, Richard W.; and Weber, Kent, 3,722,217.

Superior Electric Company, The: *See—*
Giguere, Irving J., 3,723,759.
Peterson, Thomas G.; and Giguere, Irving J., 3,723,852.

Surletta, Zygmunt M., to Lear Siegler, Inc. Spring assembly. 3,722,013, Cl. 5-247.000.

Surna, Yan Alexandrovich: *See—*
Kashkina, Nadezhda Alexandrovna; Pormale, Milda Yanovna; Kalninsh, Arvid Yanovich; Surna, Yan Alexandrovich; Baltkajs, Yanis Yanovich; and Shuster, Yan, 3,723,401.

Suryanarayana, Yelogondahally Subrananiam; and Durrell, William Sandford, to Ciba-Geigy Corporation. Apparatus for producing cyanogen chloride by spray reaction means. 3,723,065, Cl. 23-260.000.

Susi, Peter Vincent, to American Cyanamid Company. Hindered tris (meta-hydroxybenzyl) cyanurate antioxidants. 3,723,427, Cl. 260-248.0ns.

Susquehanna Corporation, The: *See—*
Scheffee, Robert S., 3,723,205.

Sussina, Stan J., to Liquidonics Industries, Inc. Security cylinder lock. 3,722,241, Cl. 70-364.00r.

Sutra Import Corporation: *See—*
Forman, David L., 3,722,461.

Sutton, Blaine M., to Smith Kline & French Laboratories. Anti-inflammatory compositions containing acylated-β-D-glucopyranosides and methods of using them. 3,723,617, Cl. 424-180.000.

Suwa, Koichiro; Satoh, Haruki; and Shida, Atsuo, to Japan Monopoly Corporation and Tanabe Seiyaku Co., Ltd. Smoking tobacco product and method of making the same. 3,722,516, Cl. 131-17.00r.

Suzuki, Akira: *See—*
Maekawa, Tadashi; Suzuki, Akira; and Haramura, Shigenori, 3,722,369.

Suzuki, Hideki, to Aisin Seiki Kabushiki Kaisha. Fluid power steering unit. 3,722,368, Cl. 91-375.00r.

Suzuki, Masaru; Iwata, Masayoshi; and Matsui, Takeo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Acceleration responsive switching device. 3,723,680, Cl. 200-61.45r.

Suzuki, Masaru, to Kabushiki-Kaisha Tokai Rika Denki Seisakusho. Relay switch. 3,723,923, Cl. 335-81.000.

Suzuki, Takahiro; and Ota, Yoshihiko, to Victor Company of Japan, Limited. System for recording and reproducing a wide-band signal. 3,723,643, Cl. 178-6.60a.

Svanstrom, Elis Kjell Ake, to Rederiaktiebolaget Nordstjernan. Method of producing refractory metals and refractory metal compounds in powder form. 3,723,601, Cl. 423-297.000.

Svidovsky, Felix Grigorievich: *See—*
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.

Swan, Neil O. Fowl dressing tool. 3,722,033, Cl. 17-11.000.

Swanson, David B.; and Miller, Barry S., to Engelhard Minerals & Chemical Corporation. Pigment for pressure sensitive record material. 3,723,174, Cl. 117-155.00a.

Swarts, James J.: *See—*
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,722,360.
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,927.
Blakey, Alexander G.; Adams, Jack S.; and Swarts, James J., 3,723,928.

Sweeney, Richard P.: *See—*
Anello, Louis Gene; and Sweeney, Richard P., 3,723,507.

Swenck, George F.: *See—*
Vickstrom, Donald E.; and Swenck, George F., 3,722,473.

SWF Spezialfabrik For Autozubehor Gustav Rau GmbH: *See—*
Weber, Martin, 3,723,721.

Swift & Company: *See—*
Miller, David M.; and Wilding, Morris D., 3,723,407.

Swift, Harold E.: *See—*
Wu, Ching Yong; and Swift, Harold E., 3,723,553.

Swift, Thomas E.; and Brayley, Elwin J., to Eltra Corporation. Capacitor discharge system. 3,722,488, Cl. 123-149.00d.

Swimmer, James A.; and Harris, Martin, to Air King Corporation. Humidifier. 3,722,838, Cl. 261-72.00r.

Swinehart, Robert L., to Leesona Corporation. Winding apparatus. 3,722,807, Cl. 242-18.00r.

Swingline, Inc.: *See—*
Malcik, Frank John; Whittemore, Edward William; and Clark, John Patrick, 3,722,701.

Swiss Aluminium Ltd.: *See—*
Hofling, Erich, 3,723,269.

Swithenbank, Colin: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,723,452.

Switzer, Robert D. Fast loading cartridge holder for revolvers. 3,722,125, Cl. 42-89.000.

Sybron Corporation: *See—*
Beach, Richard G.; Stultz, Harry, Jr.; and Symonds, James A., 3,722,373.
Pietschmann, Helmut Richard, 3,722,095.
Robbins, James F., 3,722,925.
Shuleshko, Paul, 3,723,855.

Symonds, James A.: *See—*
Beach, Richard G.; Stultz, Harry, Jr.; and Symonds, James A., 3,722,373.

System Development Corporation: *See—*
Jaffe, Richard M.; and Parente, Robert B., 3,723,718.

System-Donner Corporation: *See—*
Morris, Harold D., 3,722,293.

Tabata, Yoneho: *See—*
Kojima, Gen; and Tabata, Yoneho, 3,723,270.

T.A.D. Avanti Inc.: *See—*
Curtis, Lawrence A.; and Bonsky, Elmer C., 3,723,656.

Tagnon, Luc Andre Marcel. High toric power ophthalmic lenses. 3,722,986, Cl. 351-176.000.

Taguchi, Toshihiko: *See—*
Tanaka, Jun; Taguchi, Toshihiko; and Watanabe, Mikio, 3,723,160.

Tajchman, Edwin J.; and Brandt, James D., to Computer Image Corporation. Sync oscillator. 3,723,907, Cl. 331-143.000.

Takada, Toshio: *See—*
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.

Takahashi, Kozo: *See—*
Kokubo, Ryo; Yokomichi, Koji; Takakuwa, Yasuo; and Takahashi, Kozo, 3,723,430.

Takahashi, Masaru: *See—*
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, 3,723,093.

Takahashi, Toru: *See—*
Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, 3,722,994.

Takahashi, Yasuo: *See—*

Igarashi, Yoshikazu; Bessho, Yoshio; Kiroku, Yoshikazu; and Takahashi, Yasuo, 3,722,440.

Takakuwa, Yasuo: *See—*
Kokubo, Ryo; Yokomichi, Koji; Takakuwa, Yasuo; and Takahashi, Kozo, 3,723,430.

Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, to Asahi Shimbun Publishing Company and Tokyo Shibaura Electric Co., Ltd. Facsimile recording system for recording patterns on both sides of a recording medium. 3,723,645, Cl. 17-6.60a.

Takarada, Osamu: *See—*
Sakamoto, Teruya; Nishimura, Takemi; and Takarada, Osamu, 3,722,154.

Takeda Chemical Industries, Ltd.: *See—*
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo (said Matsui and said Goto assors. to), 3,723,372.

Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, to Bridgestone Tire Company Limited. Rubber laminates and a process for producing the same. 3,723,239, Cl. 161-170.000.

Takeuchi, Hideo: *See—*
Kobayashi, Tatsuo; Yamashita, Maki; and Takeuchi, Hideo, 3,722,382.

Takeyama, Kojiro; and Hamamoto, Masao, to Matsushita Electric Industrial Co., Ltd. Clothes drier. 3,722,106, Cl. 34-82.000.

Talbot, F. W., & Company, Limited: *See—*
Gledhill, Eric Guy Brian, 3,722,520.

Talley, James C., to United States of America, Navy. High velocity flight stabilized fragmentation device. 3,722,414, Cl. 102-67.000.

Talmo, Robert Eugene; Ham, Donald L.; and Leyrer, Lowell J., to International Telephone and Telegraph Corporation. Transducer and components therefor. 3,722,264, Cl. 73-88.50r.

Tamplen, Jack W. Seal assembly. 3,722,588, Cl. 166-123.000.

Tamura, Masanori: *See—*
Oono, Hiroshi; and Tamura, Masanori, 3,723,227.

Tanabe Seiyaku Co., Ltd.: *See—*
Suwa, Koichiro; Satoh, Haruki; and Shida, Atsuo, 3,722,516.

Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, to Canon Kabushiki Kaisha. Method and device for removing developing liquid. 3,722,994, Cl. 355-10.000.

Tanaka, Jun; Taguchi, Toshihiko; and Watanabe, Mikio, to Senju Metal Industry Co., Ltd. Zinc-plating compositions. 3,723,160, Cl. 117-50.000.

Tanaka, Katsunobu; Kimura, Kazu; and Yamaguchi, Ken, to Kyowa Hakko Kogyo Co., Ltd. Method for producing α-ketoglutaric acid. 3,723,248, Cl. 195-28.00r.

Tanaka, Mitsugu: *See—*
Iwano, Haruhiko; Tanaka, Mitsugu; Otsuki, Tetsuo; and Arai, Atsuaki, 3,723,118.

Tanaka, Shigenori: *See—*
Mizuno, Yukio; and Tanaka, Shigenori, 3,722,551.

Tanaka, Toru; Mizoguchi, Kenichi; and Nagaoka, Hiroto, to Nippon Kayaku Kabushiki Kaisha. Isomeric mixture of dibromocresyl glycidyl ether. 3,723,335, Cl. 252-182.000.

Tanaka, Yoshimi: *See—*
Sawai, Satoshi; Maekawa, Jusaburo; and Tanaka, Yoshimi, 3,723,024.

Tanaka, Yusuke: *See—*
Kayahara, Ikuta; and Tanaka, Yusuke, 3,722,229.

Tanji, Mikiharu, to ISE Electronics Corporation. Flat composite fluorescent display tube. 3,723,789, Cl. 313-108.00r.

Tankus, Harry, to Crane Packing Company. Secondary seal for rotary mechanical seal. 3,722,896, Cl. 277-87.000.

Tanso, Tukuhei: *See—*
Asou, Setsuro; Sugawara, Junichi; Tanso, Tukuhei; and Yashiro, Katsuji, 3,722,318.

Tantlinger, Keith W., to Fruehauf Corporation. Method and apparatus for loading and unloading air cargo. 3,722,716, Cl. 214-38.00b.

Tassie, Douglas P.; and Clark, Burton P., to General Electric Company. Machine gun feeding means. 3,722,356, Cl. 89-9.000.

Tatsuta, Sumitaka; and Ueno, Wataru, to Fuji Photo Film Co., Ltd. Method for the production of a photographic element. 3,723,159, Cl. 117-47.00a.

Tatsuzawa, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Television telephone system. 3,723,653, Cl. 179-2.0tv.

Tauscher, Henry, to Impact, Inc. Rotary power device. 3,723,033, Cl. 418-173.000.

Tavo, Rene B., to Lee, Raymond, Organization, The. Shoe stretcher. 3,722,016, Cl. 12-120.500.

Taylor, Alfred Charles, to Meyers Taylor Pty. Ltd. Locks. 3,722,237, Cl. 70-107.000.

Taylor, George A.: *See—*
Anderberg, Axel W.; and Taylor, George A., 3,722,142.

Taylor, Harles F.: *See—*
Colman, Albert J.; Zandberg, Paul I.; and Taylor, Harles F., 3,722,097.

Taylor, Paul H. Fluid amplified liquid spring shock absorbers with improved piston heads. 3,722,640, Cl. 188-316.000.

Taylor, Ted R.; and Fergason, James L., to International Liquid Xtal Company. Temperature indicator using the Smectic C phase of a liquid crystal. 3,723,346, Cl. 252-408.000.

Taylor, William D., to Rubbermaid Incorporated. Tilt-open drawer construction. 3,722,975, Cl. 312-348.000.

Teach, Eugene G.; and Arneklev, Duane R., to Stauffer Chemical Company. Meta-thiocarbamyl phenylene amides and ureas and their utility as herbicides. 3,723,474, Cl. 260-347.200.

Teammakers, Inc.: *See—*
Sinner, George A., 3,722,886.

Technical Communications Corporation: *See—*
Miller, Charles K., 3,723,878.

Techniservice Corporation P. O. Drawer "P": *See—*
Stanley, Robert K.; and Schwartz, Ira, 3,722,042.

Tee-Pak, Inc.: *See—*
Bridgeford, Douglas J., 3,723,306.

Teledyne Mid-America Corporation: *See—*
Church, Herman S.; and Hagener, James L., 3,722,939.

Templeton, William E. Cutter bar assembly. 3,722,196, Cl. 56-298.000.

Tenneco Oil Company: *See—*
Ray, Jack H., 3,722,607.

Tennerstedt, M. Richard, to Motorola, Inc. Disengageable tuner control apparatus. 3,722,298, Cl. 74-10.800.

Tennis, Francis H., to Hydraulic Industries, Inc. Pressure compensated control valve. 3,722,543, Cl. 137-596.120.

Terao, Shinichiro: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Terminal Data Corporation: *See—*
Gilman, Samuel, 3,722,929.

Tetamore, Robert W.: *See—*
Frey, Sydney W., Jr.; Gaa, Donald L.; and Tetamore, Robert W., 3,723,937.

Tetradyne Corporation: *See—*
Chandler, Ronald W.; and Hammond, Jack B., 3,722,276.

Tewksbury, John Merle, to Bendix Corporation, The. Frequency synthesizer. 3,723,898, Cl. 331-4.000.

Texaco Development Corporation: *See—*
Reynolds, Blake, 3,723,344.
Reynolds, Blake, 3,723,345.

Texaco Inc.: *See—*
Hahn, Frederick K., 3,723,296.

Texaco Inc., mesne: *See—*
Wolf, Robert L.; and McGain, Rodney, 3,722,220.

Texas Instruments, Incorporated: *See—*
Pearson, Samuel Reader, 3,723,843.

Textoris, Melvin A., to General Fireproofing Company. Furniture article with displaceable drawer case. 3,722,973, Cl. 312-325.000.

Thackray, Chas., F., Limited: *See—*
Charnley, John, 3,722,002.

Thaddey, Kurt, to Ciba-Geigy AG. Method of and apparatus for reading characters formed by a plurality of areas. 3,723,969, Cl. 340-146.30f.

Thakker, Mahendra T., to Continental Oil Company. Process for desulfurizing coke. 3,723,291, Cl. 208-46.000.

Thatch, Raymond Allen, to Bell Telephone Laboratories, Incorporated. Constant resistance bridged-T circuit using transmission line elements. 3,723,912, Cl. 333-20.000.

Theobald, Paul R.; and Bailey, Joseph T., to American Lava Corporation. Alumina palladium composite. 3,723,176, Cl. 117-212.000.

Theurer, Josef: *See—*
Plasser, Franz; and Theurer, Josef, 3,722,423.

Thies, Richard O.: *See—*
Hiestand, James C.; and Thies, Richard O., 3,722,497.

Thiokol Chemical Corporation: *See—*
Dinsdale, Vern Thomas; Redd, Russell, Jr.; and Meyer, Robert E., 3,723,206.

Thom, Karl F., to Minnesota Mining and Manufacturing Company. Preparation of perfluoroacyl fluorides and perfluorocarboxylic acids. 3,723,485, Cl. 260-408.000.

Thomas, Alan; and Heath, Ronald Alfred, to Lucas, Joseph, (Industries) Limited. Fluid pressure transducers. 3,723,926, Cl. 335-268.000.

Thomas, David Gilbert: *See—*
Nakada, Yoshinao; and Thomas, David Gilbert, 3,723,690.

Thomas, David W., to NL Industries, Inc. Sweeping composition. 3,723,321, Cl. 252-88.000.

Thomas, Eddie R.: *See—*
Treharne, Richard W.; Riley, James A.; and Thomas, Eddie R., 3,722,283.

Thomas, Gordon A.: *See—*
Alkaitis, Anthony; and Thomas, Gordon A., 3,723,152.

Thomas, Klaus: *See—*
Ost, Walter; and Thomas, Klaus, 3,723,454.

Thomas, McKinely B.: *See—*
Pitts, Ralph W.; and Thomas, McKinely B., 3,722,362.

Thomas, Roy L., Jr., to Charles Supper Company. Method and apparatus for selecting and handling particulate specimens using a vacuum probe. 3,723,006, Cl. 356-30.000.

Thominet, Michel Leon, to Societe d'Etudes Scientifiques et Industrielles de L'Ile-de'France. Substituted 2-arylalkyloxy benzamides. 3,723,416, Cl. 260-239.0bf.

Thompson, Chester C., Jr., to Radiation Dynamics, Inc. High voltage power supply. 3,723,846, Cl. 321-15.000.

Thompson, Herbert Lytle, to Universal Oil Products Company. Aromatic hydrocarbon recovery by extractive distillation, extraction and plural distillations. 3,723,256, Cl. 203-43.000.

Thompson, John; and Owen, Michael James, to Midland Silicones Limited. Organosiloxane polyamide block copolymers. 3,723,566, Cl. 260-824.00r.

Thompson, John H.: *See—*
Nelkin, Arthur; and Thompson, John H., 3,723,954.

Thompson, Richard D.: *See—*
Beeley, Michael G.; and Thompson, Richard D., 3,722,116.

Thompson, Robert M., to Sun Research and Development Co. Process for preparing unsaturated polyester. 3,723,573, Cl. 260-866.000.

Thompson, Roy E.: *See—*
Phillips Arthur B.; and Thompson, Roy E., 3,722,825.

Thompson, William B.: *See—*
Jones, Rexford W.; and Thompson, William B., 3,723,123.
Jones, Rexford W.; and Thompson, William B., 3,723,124.

Thomsen, Milton P. Rebne, to United States of America, Army. Arc lamp with magnetic vortex anode. 3,723,782, Cl. 313-30.000.

Thomson-CSF: *See—*
Charles, Daniel R., 3,723,786.
Guyot, Joel, 3,723,869.

Thorn, Herbert; and Berkin, Harvey, to Ideal Toy Corporation. Housekeeping doll having reversible motor driving selectively movable arms. 3,722,136, Cl. 46-247.000.

Thrailkill, Arthur E.; and Geene, Robert W., to United States of America, Army. Solid bipropellant. 3,722,421, Cl. 102-101.000.

Thumm, Wilhelm; and Nagel, Horst, to Metallgesellschaft Aktiengesellschaft and Steel Company of Canada, Ltd., The. Method of restricting the oxidation of sponge iron. 3,723,059, Cl. 21-2.500.

Thurk, Gerhard; and Beier, Helmut, to Siemens Aktiengesellschaft. High voltage circuit breaker. 3,723,685, Cl. 200-148.00e.

Tidwell, Calvin M.; and Henneberg, Val G., to Petro-Tex Chemical Corporation. Isomerization of butene-1 to cis-butene-2. 3,723,564, Cl. 260-683.200.

Tiley, Michael: *See—*
Johns, Antony; Tiley, Michael; and McDonnell, Patrick, 3,723,268.

Tillotson, Charles J.: *See—*
Satkin, David M.; Helvie, Gene B.; and Tillotson, Charles J., 3,722,163.

Timex Corporation: *See—*
Sahpiro, Robert C., 3,723,749.

Tingley, Loyal H., Jr. Bolster case for textile spinning and drawing machines. 3,722,200, Cl. 57-130.000.

Tinyakova, Elena Ivanovna: *See—*
Dolgoplosk, Boris Alexandrovich; Tinyakova, Elena Ivanovna; Beilin, Solomon Isaakovich; Makovetsky, Kirill Lvovich; Chernenko, Galina Motseevna; Ostrovskaya, Irina Yakovlevna; Garmonov, Izmail Vladimirovich; Mamontov, Boris Vasilievich; and Kon, Alexandra,3,723,400.

Tirkkonen, Erkki Tapio. Patient scales. 3,722,611, Cl. 177-144.000.

Tobias, Michael A.; and Strong, Jerry G., to Mobil Oil Corporation. 2-Substituted-thio-2-cyclohexene-1-one and method for preparing them. 3,723,531, Cl. 260-586.00r.

Tobinick, Sidney; and Semenoff, Arnold, to Aqua Therm Products Corporation. Water bed having attached pillow. 3,722,012, Cl. 5-348.0wb.

Toho Beslon Kabushiki Kaisha: *See—*
Yoshida, Masatoshi; and Hirai, Minoru, 3,723,378.

Toho Machine Co., Ltd.: *See—*
Shimoda, Seisuke; and Shimoda, Yoshiaki, 3,722,893.

Tokyo Kakin Kogyo Co., Ltd.: *See—*
Matsumoto, Hiroshi, 3,723,100.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Goto, Eizo, 3,723,788.
Takami, Hirohiko; Kawashima, Toshihide; Kubota, Ryomei; and Sukegawa, Chosei, 3,723,645.
Toyama, Masaharu; and Sekiwa, Tetuo, 3,723,177.

Tokyo Shoketsu Kinzoku Kabushiki Kaisha: *See—*
Iwase, Keizo; Takada, Toshio; Bando, Yoshichika; Kiyama, Masao; Naito, Itsusaku; and Kazihara, Masao, 3,723,587.

Tolosa, Felix P.: *See—*
Craig, Dwin Richardson, 3,722,980.

Tomalia, Donald A.; and Paige, Janet N., to Dow Chemical Company, The. Bi-2-oxazoline and oxazine ethers and thioethers. 3,723,451, Cl. 260-307.00f.

Tomasi, Biagio J.: *See—*
Potter, Olin E.; and Tomasi, Biagio J., 3,722,187.

Tomilin, Alexandr Grigorievich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.

Tomimori, Kiyoshi: *See—*
Kawashima, Masao; Ohtsuki, Mikio; Fudemoto, Isao; and Tomimori, Kiyoshi, 3,723,875.

Tomko, Lawrence Andrew: *See—*
Krupp, Roy Stephen; and Tomko, Lawrence Andrew, 3,723,985.

Tomlin, Bruce Warren: *See—*
Hill, George Edward; and Tomlin, Bruce Warren, 3,722,536.

Topham, Arthur: *See—*
Backhouse, Margaret Peddie; Topham, Arthur; and Tury, Bernard, 3,723,151.

Toray Industries, Inc.: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.

Torii, Tatsumi; and Miyajima, Haruo, to Aisin Seiki Kabushiki Kaisha. Automotive wheel brake mechanism fitted with automatic brake gap and adjuster. 3,722,635, Cl. 188-79.50p.

Toti, Andrew J. Method of forming a structural unit. 3,722,052, Cl. 29-155.00r.

Totschnig, Manfred, to Volkswagenwerk Aktiengesellschaft. Device for indicating the actuated position of a manual brake and of the wear of the brake lining, especially for motor vehicles. 3,722,629, Cl. 188-1.00a.

Tourtellotte, John F., to Chemical Construction Corporation. Apparatus for removing hydrocarbons from a gas stream. 3,722,189, Cl. 55-389.000.

Towns, Donald L.: *See—*
Start, John F.; and Towns, Donald L., 3,723,472.

Townsend, Charles L. Gate valve. 3,722,857, Cl. 251-203.000.

Toyama, Masaharu; and Sekiwa, Tetuo, to Tokyo Shibaura Electric Co., Ltd. Method of producing a Group III-V semiconductor compound. 3,723,177, Cl. 117-217.000.

Toyo Soda Manufacturing Co.: *See—*
Ono, Isao; Yanagihara, Tadahisa; Okada, Hiroaki; and Uotani, Takeshi, 3,723,510.

Toyoda, Hiroshi: *See—*
Hirata, Hiroshi; and Toyoda, Hiroshi, 3,722,600.

Toyooka, Tadao; Nishida, Takeo; and Ichihara, Hiroshi. Storage battery with heater. 3,723,187, Cl. 136-161.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ogasawara, Takeo; and Ishikawa, Masakazu, 3,722,634.

Tozzi, Joseph, to Philco-Ford Corporation. Automotive headlamp delayed off device. 3,723,807, Cl. 315-83.000.

Transfer Systems Incorporated: *See—*
Jones, Cecil R., 3,722,332.

Trask, Warren T.: *See—*
Stevenson, John W.; and Trask, Warren T., 3,723,075.

Treadwell Corporation: *See—*
Jones, Herbert Francis, 3,722,170.

Treharne, Richard W.; Riley, James A.; and Thomas, Eddie R., to Kettering Scientific Research, Inc. Linear reading thermometer. 3,722,283, Cl. 73-362.560.

Tremblay, Denis. Snag shield and scent carrier for lure hooks. 3,722,128, Cl. 43-42.100.

Triplite Limited: *See—*
Cooke, Albert Edward, 3,722,231.

Triskelion Corporation: *See—*
Ulm, Erwin H.; and June, Robert, II, 3,722,666.

Troemel, Gerhard: *See—*
Leduc, Joseph-Adrien; Konrad, Peter; and Troemel, Gerhard, 3,723,264.

Troen, Edvard: *See—*
Narvesen, Bjarne; and Troen, Edvard, 3,722,413.

Trombatore, Adelene L.: *See—*
Prince, Zodell W.; Weatherholt, Dallas D.; and Trombatore, Adelene L., 3,723,219.

Trotman, Herbert H. Underbody ventilating structure. 3,722,955, Cl. 297-453.000.

Troutner, Arthur L., to Trus Joist Corporation. Continuous press for pressing glue-coated consolidatable, press charges. 3,723,230, Cl. 156-580.000.

Troy, James E.: *See—*
MacIsaac, John T., Jr.; and Troy, James E., 3,722,442.

Tru-Fit Products Corporation: *See—*
Logan, Lewis J.; and Sandoval, Dante J., 3,723,698.

Trus Joist Corporation: *See—*
Troutner, Arthur L., 3,723,230.

Trust of Blecther, Ralph E.; deceased, 10%: *See—*
Bletcher, James H.; and Rauh, Jack K., 3,722,798.

TRW Inc.: *See—*
Aranguren, Jorge; and Stansel, John C., 3,723,742.
Bernier, Robert V., 3,723,904.
Brenneke, Arthur M., 3,722,897.
Heflinger, Lee O., 3,723,958.
Wheaton, Harold L.; and Bishop, Thomas H., 3,723,097.
Wilhelmi, Julius B., 3,722,026.

Tsareva, Nina Alexandrovna: *See—*
Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler, Andrei Maximilianovich; and Vishnyak, Idal Aizikovich, 3,722,204.

Tseltkov, Alexandr Ivanovich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Molnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Tsimbler, Jury Abramovich: *See—*
Alexandrov, Adolf Moritsovich; Suladze, Ippolit Davidovich; Aglitsky, Vladimir Efimovich; Kakhniashvili, Avtandil Sememovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Rozenfeld, Matvei Iosifovich; and Chidzhavadze, Grigory Yasonovich, 3,722,42.

Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler,

Andrei Maximilianovich; and Vishnyak, Idal Aizikovich. Apparatus for producing highly stretchable twist cotton yarn. 3,722,204,Cl. 57-164.000.
Tsuda, Hisashi; and Oyamada, Masahiro. Double stroke-double blow header. 3,722,253, Cl. 72-338.000.
Tsuji, Jiro: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.
Tsukada, Shusei: *See—*
Tanaka, Hiroshi; Saito, Takashi; Tsukada, Shusei; Takahashi, Toru; and Katayama, Hajime, 3,722,994.
Tsukuba, Korehiko: *See—*
Sakakibara, Naoji; Kawabata, Yasuhiro; and Tsukuba, Korehiko, 3,722,614.
Tsunoda Jitensah Kabushiki Kaisha: *See—*
Housayama, Akira, 3,722,912.
Tsunoda Jitensha Kabushiki Kaisha: *See—*
Housayama, Akira, 3,722,913.
Tsurugi, Junzo: *See—*
Shiba, Tadahisa; Saito, Tamekazu; Tsurugi, Junzo; Takahashi, Masaru; and Goto, Kunihiro, 3,723,093.
Tubal Industries, Inc., mesne: *See—*
Kirchner, Myron C., 3,722,043.
Tucker, Thomas M.; and Clemett, Edwin F., Jr., to McCord Corporation. Snap action switch assembly. 3,723,683, Cl. 200-78.000.
Tugukuni, Hideyosi: *See—*
Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo, 3,723,372.
Tuites, Donald E.: *See—*
Hoh, George L. K.; and Tuites, Donald E., 3,723,397.
Tulkoff, Martin J. Apparatus for heat shrinking material about loaded pallet. 3,723,708, Cl. 219-385.000.
Tunneblom, Eskil, to Aktiebolaget Vibro-Verken. Dual amplitude vibration generator. 3,722,381, Cl. 94-50.00v.
Tupper, George L., to Oxy Metal Finishing Corporation. Process for recovering coating materials. 3,723,148, Cl. 106-287.0pr.
Tupper, Wyman C.: *See—*
Flaherty, Francis E.; and Tupper, Wyman C., 3,723,195.
Turkdogan, Ethem T.: *See—*
Fruehan, Richard J.; and Turkdogan, Ethem T., 3,723,279.
Turmix AG: *See—*
Wunderlin, Max, 3,723,707.
Turner, Wilson R.: *See—*
Kruger, William P.; and Turner, Wilson R., 3,723,729.
Tury, Bernard: *See—*
Backhouse, Margaret Peddie; Topham, Arthur; and Tury, Bernard, 3,723,151.
Twigg, Peter Lindsay; and Parry, Philip James, to International Nickel Company, Inc., The. Nickel-chromium-cobalt alloys. 3,723,108, Cl. 75-171.000.
Twin Disc, Incorporated: *See—*
Steinhagen, Horst G., 3,722,644.
Tye, Gene: *See—*
Smith, Gene K.; and Tye, Gene, 3,723,005.
Uchida, Yasuo, to Ishikawa Tekko Kabushiki Kaisha. Swivel joint. 3,722,931, Cl. 287-93.000.
Uchiyama, Yoshihiro; Nakano, Yoshiyuki; Kishigami, Takashi; and Arie, Ryosuke, to Hitachi, Ltd. Automatic valve changeover apparatus for a turbine. 3,723,018, Cl. 415-30.000.
Udovic, Daniel John, to Bell Telephone Laboratories, Incorporated. Quasi-RMS measurement circuit utilizing field effect transistor as a switch. 3,723,763, Cl. 307-229.000.
Ueda, Bunzo: *See—*
Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, 3,723,127.
Ueno, Katsuhiro; Ohmura, Yoshiaki; Moroi, Reimei; Akashi, Akira; Arimoto, Masahiro; and Kasahara, Akira, to Daiichi Seiyaku Co., Ltd. Pyrimidinylpyrazole derivatives and methods for preparing the same. 3,723,433, Cl. 260-256.40c.
Ueno, Wataru: *See—*
Tatsuta, Sumitaka; and Ueno, Wataru, 3,723,159.
Ulery, Harris Ellsworth, to Du Pont de Nemours, E. I., and Company. Lubricant greases. 3,723,317, Cl. 252-51.50r.
Ulm, Erwin H.; and June, Robert, II, to Triskelion Corporation. Tubular conveyor. 3,722,666, Cl. 198-213.000.
Ulrich, Henri: *See—*
Smith, Curtis P.; and Ulrich, Henri, 3,723,520.
Smith, Curtis P.; and Ulrich, Henri, 3,723,521.
Umezawa, Kouji, to Nippon Piston Ring Kabushiki Kaisha. Process of making a piston ring. 3,723,259, Cl. 204-15.000.
Ungar, Israel S.: *See—*
Scher, Herbert I.; and Ungar, Israel S., 3,723,220.
Unger, Robert M. Ground mounting base for central air conditioner heat exchanger units. 3,722,845, Cl. 248-346.000.
Uni Filter, Inc.: *See—*
Parker, Jerry W.; Scholz, John W.; and Mitchell, Kenneth E., 3,722,186.
Union Camp Corporation: *See—*
Barker, Ricard G., 3,723,242.
Union Carbide Corporation: *See—*
Chow, Sui-Wu; and Matzner, Markus, 3,723,367.
Mellors, Geoffrey W., 3,723,185.
Yancey, Paul Joseph, 3,723,337.
United Aircraft Corporation: *See—*
Anderson, John R.; and Perron, James S., 3,722,574.
Kusiak, Edward H., 3,722,641.
United Brands Company: *See—*
Scott, James; and McDowell, John S., Jr., 3,722,230.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in her Britannic Majesty's Government of The, mesne: *See—*
Copping, Christopher; and Uri, Norbert, 3,723,384.
McPherson, Alasdair, 3,722,272.
United States Borax & Chemical Corporation: *See—*
Hamblyn, Stephen Mark; Money, Anthony Patrick; and MacKinnon, Ian Malcolm, 3,723,290.
United States Gypsum Company: *See—*
Lane, Marvin K., 3,723,146.
United States of America
Agriculture: *See—*
Berry, Robert E.; and Wagner, Charles J., Jr., 3,723,133.
Donaldson, Darrell J.; and Daigle, Donald J., 3,723,057.
Indarte, Rafael Audivert, 3,722,202.
Reinhardt, Robert M.; and Kullman, Russell M. H., 3,723,058.
Air Force: *See—*
Brayton, Donald B., 3,723,004.
Crick, Virlon, 3,723,023.
Eklund, Phillip R., 3,722,969.
Hasse, Hans O., 3,722,875.
Wall, James A.; and Burke, Edward A., 3,723,740.
Army: *See—*
Bartilson, Benjamin M., 3,722,553.
Field, Lamar; and Barbee, Robert B., 3,723,513.
Thomsen, Milton P. Rebne, 3,723,782.
Thrailkill, Arthur E.; and Geene, Robert W., 3,722,421.
Atomic Energy Commission: *See—*
Breillatt, Julian P., Jr., 3,723,244.
Ehlers, Kenneth W.; Brown, Ian G.; and Lietzke, Alan F., 3,723,703.
Godfrey, Wesley L., 3,723,338.
Gordon, Frank J.; and Damm, Charles C., 3,723,730.
Lubin, Moshe J., 3,723,246.
Nixon, Jack M.; and Ramler, Warren J., 3,723,785.
Proctor, Stephen G., 3,723,594.
Reimann, George A.; and Martin, William R., 3,723,193.
Von Ehrenstein, Dieter, 3,723,741.
Wogman, Ned A.; Perkins, Richard W.; Rieck, Henry G.; and Cooper, John A., 3,723,727.
Atomic Energy Commission, mesne: *See—*
Butler, John Mann; Follett, Archie E.; and Cass, Robert A., 3,723,202.
Stirland, Meade A.; and Kalinowski, John A., 3,723,013.
National Aeronautics and Space Administration in respect to the invention of; Administrator; :
Campbell, Fred D.; and Campbell, Fred D. Radiant source tracker independent of non-constant irradiance. 3,723,745, Cl. 250-203.000.
Navy: *See—*
Altar, William; and Helstrom, Carl W., Jr., 3,722,447.
Camp, Albert T., 3,723,207.
Cooke, David A., 3,722,446.
De Simone, David N.; and Catroppa, Frank A., 3,721,994.
Fogal, Gordon L.; and Kennedy, Thomas W., 3,722,407.
Fox, John O.; and Rosling, Thomas H., 3,722,408.
Gauchat, Richard H.; and Sabel, Nathan W., 3,723,944.
Gregoire, Harvey G., 3,722,103.
Harris, Jack R., 3,723,960.
Hecker, Klaus J., 3,723,799.
Hitchcock, Robert D.; and McMahan, Gene P., 3,722,579.
Horton, Richard F., 3,723,739.
Karig, Horace Edmund; and De Vries, Gerrit, 3,722,445.
Kush, Louis J., Jr.; and Baker, Walter L., 3,723,951.
Lewis, Harry R., 3,722,967.
Lunt, Wilbur B., 3,722,415.
Lunt, Wilbur B.; and Brown, Maurice H., 3,722,416.
Mann, Ralph W.; and Johnson, Frank B., 3,722,409.
Meraz, Daniel, Jr., 3,723,214.
Nelkin, Arthur; and Thompson, John H., 3,723,954.
Robinson, Ralph O., Jr., 3,722,417.
Schulz, Raymond A., 3,723,776.
Seiple, Ronald L.; Ashenden, Edward A.; and Webb, Robert L., 3,722,941.
Speiser, Jeffrey M.; and Whitehouse, Harper John, 3,723,916.
Spencer, Duane Robert, 3,722,219.
Talley, James C., 3,722,414.
Whiteley, Thomas B., 3,723,891.
Wynn, John F., Jr., 3,722,452.
Navy, The: *See—*
Scarpino, Theodore J.; and Holbrook, Douglas W., 3,723,805.
United States Steel Corporation: *See—*
Fruehan, Richard J.; and Turkdogan, Ethem T., 3,723,279.
Gallucci, Francis, 3,722,576.
Hofmann, Gottfried; and Schwartz, George F., 3,722,575.
Murphy, William J.; and Spaeder, Gerald J., 3,723,196.
Pitts, Ralph W.; and Thomas, McKinely B., 3,722,362.
Unity Manufacturing Co.: *See—*
Jaeger, Robert O., 3,723,725.
Universal Oil Products Company: *See—*
Brennan, John F., 3,723,535.

Breunich, Theodore R.; and Hildenbrandt, August J., Jr., 3,722,534.
Carson, Don B.; and Hennemuth, William R., 3,723,072.
Carson, Don B.; and Hennemuth, William R., 3,723,300.
Cyba, Henryk A., 3,723,383.
Gatsis, John G.; and Gleim, William K. T., 3,723,294.
Gatsis, John G.; and Gleim, William K. T., 3,723,297.
Gleim, William K. T.; and Ramquist, Frederick C., 3,723,560.
Hayes, John C., 3,723,557.
Louvar, James J., 3,723,532.
Massie, Stephen N.; and Illingworth, George E., 3,723,303.
Massie, Stephen N., 3,723,316.
Massie, Stephen N., 3,723,517.
Mitsche, Roy T.; and Michalko, Edward, 3,723,552.
Pharis, Joe M.; and Adams, Frank H., 3,723,302.
Priegnitz, James W., 3,723,561.
Rice, Lynn H., 3,723,301.
Schmerling, Louis, 3,723,473.
Thompson, Herbert Lytle, 3,723,256.
Wilhelm, Frederick C., 3,723,554.
Wilhelm, Frederick C., 3,723,556.

Universal Refrigeration, Inc.: *See—*
Stevens, Walter Chandler, Jr.; and More, Philip M., 3,723,050.

Universite de Sherbrooke: *See—*
Deslongchamps, Pierre, 3,723,506.

University of California, Regents of the: *See—*
Kolin, Alexander, 3,722,505.

University of Pennsylvania, The Trustees of the: *See—*
Rutman, Robert J., 3,723,621.

Uotani, Takeshi: *See—*
Ono, Isao; Yanagihara, Tadahisa; Okada, Hiroaki; and Uotani, Takeshi, 3,723,510.

Upjohn Company, The: *See—*
McLaughlin, Alexander; Nadeau, Herbert G.; and Rose, James S., 3,723,364.
Pike, John E., 3,723,528.
Smith, Curtis P.; and Ulrich, Henri, 3,723,520.
Smith, Curtis P.; and Ulrich, Henri, 3,723,521.

Urani, Angelo, to McGraw-Edison Company. Protectors for electric circuits. 3,723,931, Cl. 337-342.000.

Uri, Norbert: *See—*
Copping, Christopher; and Uri, Norbert, 3,723,384.

Urmenyi, William Robert. Capacitance proximity switch. 3,723,885, Cl. 328-5.000.

U.S. Philips Corporation: *See—*
Arnoldussen, Theodorus Franciscus, 3,722,829.
Bos, Julius Goeman; Draaijer, Harm; and Duyve, Jan, 3,723,191.
Klomp, Johannes, 3,722,074.
Lambertus, Wanmaker Willem; and Emmasingel, Johannus Godefridus, 3,723,339.
Leymonerie, Paul, 3,722,069.
Loy, Fernand Rene, 3,722,282.
Oxenham, John Kenneth, 3,723,801.
Schouten, Gerrit Hilbertus, 3,723,984.
Sharp, Denis, 3,723,764.
Van Gerwen, Petrus Josephus, 3,723,880.
Westerhof, Pieter; and Morsink, Lucas, 3,723,482.

U.S. Philips Corporation, mesne: *See—*
Peters, Gerardus Johannes Anthonius, 3,723,834.
Van Amstel, Johannes Jacobus Asuerus Ploos, 3,723,706.
Wolf, Gerrit, 3,723,917.

U.S. Phillips Corporation, mesne: *See—*
Blasse, George; and DeVries, Jaap, 3,723,787.

USM Corporation: *See—*
Kitchener, Charles J.; and Rumball, Paul G., 3,722,441.

Utz, Kastulus; and Antholzner, Heinrich, to Multifol Patentverwertungs AG. Method of producing laminated plastic foil tubing. 3,723,168, Cl. 117-94.000.

Uvarova, Alexandra Vasilievna: *See—*
Baiborodov, Pavel Petrovich; Uvarova, Alexandra Vasilievna; Gerasimov, Ivan Konstantinovich; Ezhkov, Alexandr Borisovich; and Kolbin, Nikolai Arkadievich, 3,723,267.

Uwamoto, Hiroshi: *See—*
Fujii, Seiji; Uwamoto, Hiroshi; Ishida, Masayuki; and Kamata, masamoto, 3,722,244.

Valentino, Pete P. CAPO. 3,722,346, Cl. 84-318.000.

Vallet, Jean-Yves: *See—*
Lazzari, Jean-Pierre; Melnick, Igar; and Vallet, Jean-Yves, 3,723,665.

Vallone, Giacinto: *See—*
Miller, Homer R.; and Vallone, Giacinto, 3,723,932.

Van Allen, David; and Knight, Frank W., to Polaroid Corporation. Unique waste-free camera system of the self-developing type. 3,722,383, Cl. 95-13.000.

Van Amstel, Johannes Jacobus Asuerus Ploos, to U.S. Philips Corporation, mesne. Wick type evaporator. 3,723,706, Cl. 219-274.000.

Van Arsdale, Lyle R.; and Lathrop, Francis M., III, to M & J Valve Company. Pipeline by-pass flow control system. 3,722,530, Cl. 137-268.000.

Van Gerwen, Petrus Josephus, to U.S. Philips Corporation. System for the transmission of multilevel data signals. 3,723,880, Cl. 325-38.00a.

Van Greuingen, Theodore A., to Aluminum Company of America. Portable fastening tool. 3,722,280, Cl. 72-294.000.

Van Gulick, Norman M.: *See—*
Apotheker, David; and Van Gulick, Norman M., 3,723,348.

van Hattem, Nicolaas: *See—*
Plate, Geerardus G.; and van Hattem, Nicolaas, 3,722,773.

Van Hecke, George J.; and Masinda, Albert G., to Huck Manufacturing Company. Fastener installation tool. 3,722,329, Cl. 81-10.000.

Van Iderstine, Theodore J.; and Bonnell, Leonard J., to Dyonics, Incorporated. Helicopter lighting. 3,723,722, Cl. 240-7.700.

van Kampen, Daniel Marten; and Pasztor, Foscarina, nee Rozzo, to Lever Brothers Company. Granular proteolytic enzyme composition. 3,723,327, Cl. 252-110.000.

Van Koppen, Christianus W. J., to Stamicarbon N.V. Pulse column with piston drive and resilient gas cushion. 3,723,069, Cl. 23-267.00c.

Van Ness, Paul J.; and Van Ness, William A. Feeding bowl for animals. 3,722,476, Cl. 119-61.000.

Van Ness, William A.: *See—*
Van Ness, Paul J.; and Van Ness, William A., 3,722,476.

Van Orsdel, John R., to Aeronca, Inc. Brazing powder deposition method. 3,722,071, Cl. 29-471.100.

Van Uitert, Le Grand Gerard: *See—*
Pinnow, Douglas A.; and Van Uitert, Le Grand Gerard, 3,722,981.

Van Veldhuizen, John. Air track and vehicle therefor. 3,722,424, Cl. 104-23.0fs.

Vanderfaeillie, Willy, to N.V. Bekaert S.A. Apparatus for connecting the free ends of a twisted wire joint to an elongate member. 3,722,554, Cl. 140-115.000.

Vanderpool, Clarence D.: *See—*
Chiola, Vincent; Smith, James S.; and Vanderpool, Clarence D., 3,723,792.

Vandersall, Howard L.: *See—*
Sears, Paul G.; and Vandersall, Howard L., 3,723,074.

Vanguard Industries, Inc.: *See—*
Herolzer, Ralph H., 3,722,735.

Vasiliev, Jort Nikolaevich: *See—*
Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich, 3,722,215.

VEB Filmfabrik: *See—*
Walther, Bernhard, 3,722,387.

Veceslav, Harnaj D., to Institutul de Petrol, Gaze Si Geologie. Procedure for a directed hydraulic fill. 3,722,138, Cl. 47-58.000.

Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Levin, Alfred A., 3,723,439.

Vemco Products, Inc.: *See—*
Miller, Harold L., 3,722,141.

Venables, Herbert J., III, to Venables Machine and Tool Company, The. Machine for making a heat exchanger tube. 3,722,059, Cl. 29-202.00d.

Venables Machine and Tool Company, The: *See—*
Venables, Herbert J., III, 3,722,059.

Vendo Company, The: *See—*
Buescher, Wilhelm, 3,722,650.
Hennessy, John A., 3,722,653.

Ventre, Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Hinges with built-in door check. 3,722,027, Cl. 16-50.000.

Venuto, C. Joseph, to ESB Incorporated. Lead acid storage battery wherein a positive plate comprises antimony dispersed throughout the active material. 3,723,182, Cl. 136-26.000.

Vepa AG: *See—*
Fleissner, Heinz, 3,723,161.

Verderevsky, Vadim Anatolievich: *See—*
Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich, 3,722,249.

Verhart, Willem Jan, to Martonair Limited. Electro magnetic valve. 3,722,531, Cl. 137-271.000.

Verkhovtsev, Emily Vladimirovich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Vermeer, Gary J. Method and machine for forming a large round bale of a fibrous material. 3,722,197, Cl. 56-341.000.

Vernitron Corporation: *See—*
Carlstein, Joseph, 3,723,986.

Vetco Offshore Industries, Inc.: *See—*
Nelson, Bobby H.; and Baugh, Benton F., 3,722,585.

Via, William F., Jr. Dentistry bite or prop block. 3,722,101, Cl. 32-40.00r.

Vickstrom, Donald E.; and Swenck, George F., to Reynolds Metals Company. Floor construction and member for making same. 3,722,473, Cl. 119-28.000.

Vickstrom, Donald E., to Reynolds Metals Company. Connector-spacer and floor construction using same. 3,722,474, Cl. 119-28.000.

Victor Company of Japan, Limited: *See—*
Fujita, Mitsuo, 3,723,638.
Suzuki, Takahiro; and Ota, Yoshihiko, 3,723,643.

Vilotti, Donald R. Supports for gymnastic beam. 3,722,881, Cl. 272-60.000.

Vishnyak, Idal Aizikovich: *See—*
Tsirkel, Elena Ernestovna; Stepanova, Ljudmila Nikolaevna; Schiptsova, Antonina Vasilievna; Tsareva, Nina Alexandrovna; Nessler, Andrei Maximilianovich; and Vishnyak, Idal Aizikovich, 3,722,204.

Visser, Hendrik. Wind instrument. 3,722,348, Cl. 84-380.000.

Viste, Kenneth L.: *See—*
Horrom, Bruce W.; Crovetti, Aldo J.; and Viste, Kenneth L., 3,723,523.
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,723,452.

Vital Assists, Inc.: *See—*
Radford, David L., 3,723,305.

Vochenhuber, Karl: *See—*
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.

Vockenhuber, Karl; and Keznickl, Eduard, said Keznickl assor. to Hauser, Raimund. Rangefinder. 3,723,003, Cl. 354-4.000.

Voelsch, Delwin F., to Schull Construction Co. Breaker for plastic form ties. 3,722,555, Cl. 140-123.000.

Vogel, Christian: *See—*
Berrer, Dagmar; and Vogel, Christian, 3,723,088.

Vogel, Karl E., to Improved Machinery Inc. Continuous digester having self-regulating wood chip level. 3,723,243, Cl. 162-52.000.

Vogt, Herwart C.: *See—*
Davis, Pauls; and Vogt, Herwart C., 3,723,404.

Voith, J. M., GmbH: *See—*
Krautzberger, Franz, 3,722,465.

Volkswagenwerk Aktiengesellschaft: *See—*
Schwenk, Kurt, 3,722,876.
Totschnig, Manfred, 3,722,629.

Volpp, Gert Paul; and Dounchis, Harry, to FMC Corporation. N-(4-cyano-1,2,3-thiadiazol) propionamide. 3,723,448, Cl. 260-306.80d.

Von Benningsen, Gerd, to Reinz Dichtungs-Gesellschaft. Sealing arrangement. 3,722,898, Cl. 277-206.000.

Von Ehrenstein, Dieter, to United States of America, Atomic Energy Commission. Method for effecting nuclear polarization of a beam of atoms. 3,723,741, Cl. 250-84.000.

Von Freyhold, Helmut, to Henkel & Cie G.m.b.H. Method for inhibiting corrosion and mineral deposits in water systems. 3,723,333, Cl. 252-175.000.

Von Haumeder, Walter. Method and apparatus for refining molten metal. 3,722,873, Cl. 266-34.001.

von Hayn, Ernst, to Butzbacher Weichenbau Gesellschaft mbH. Crossing frog with a movable frog point. 3,723,728, Cl. 246-468.000.

von Lowis of Menar, Alexander, to Bosch, Robert, G.m.b.H. Braking system for automotive vehicles with means for preventing the locking of wheels during braking. 3,722,960, Cl. 303-21.0af.

Von Meyer, William C.: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,723,452.

Von Roll AG. Werk Bern: *See—*
Feuz, Fritz, 3,722,632.

Vondran, Daniel J., to Motorola, Inc. EVR player lens system. 3,722,990, Cl. 352-231.000.

Vora, Madhukar B., to International Business Machines Corporation. Outdiffusion epitaxial self-isolation technique for making monolithic semiconductor devices. 3,723,199, Cl. 148-175.000.

Vorobiev, Vladimir Yakovlevich: *See—*
Okun, Sigizmund Semenovich; Sergeenkov, Boris Nikolaevich; Kiselev, Valentin Makhailovich; Ivanov, Vasily Sergeevich; and Vorobiev, Vladimir Yakovlevich, 3,723,853.

Voss, Peter: *See—*
Niederprum, Hans; Voss, Peter; and Beyl, Volker, 3,723,512.

Voytko, Charles L.: *See—*
Pierson, Raymond C., Jr.; and Voytko, Charles L., 3,722,906.

Vulcan Materials Company: *See—*
Wilson, Harold P., 3,723,273.

Vulcano, Vincent N., to Cumpu-Sort Systems, Inc. Apparatus for stripping covers from paperback books and the like. 3,722,342, Cl. 83-418.000.

Wacker-Chemie G.m.b.H.: *See—*
Fischer, Walter; and Heckmaier, Joseph, 3,723,610.

Wada, Masamichi; Ishida, Iwao; and Nakagawa, Isamu, to Nippon Electric Glass Company, Limited. X-ray absorbing glass compositions containing lead oxide and cerium oxide. 3,723,354, Cl. 252-478.000.

Wada, Yasuo: *See—*
Kinjo, Kikuo; Yamanouchi, Teruo; Kondo, Eiichi; and Wada, Yasuo, 3,723,116.

Wagenknecht, Paul A.: *See—*
Bartley, Thomas S.; and Wagenknecht, Paul A., 3,722,469.

Wagner, Charles J., Jr.: *See—*
Berry, Robert E.; and Wagner, Charles J., Jr., 3,723,133.

Wagner Electric Corporation: *See—*
Atkins, Carl E.; and Carlson, Paul A., 3,723,967.

Wagner, Hans: *See—*
Jakobi, Wilhelm; Kumper, Ernst; and Wagner, Hans, 3,723,054.

Wagner, Kuno: *See—*
Konig, Klaus; Muller, Erwin; and Wagner, Kuno, 3,723,392.

Wagner, Peter: *See—*
Gunter, Gehrke; Hederich, Volker; Harms, Wolfgang; and Wagner, Peter, 3,723,480.

Wakabashi, Manzo. Emergency stopping device for a wheeled vehicle. 3,722,630, Cl. 188-4.00r.

Wakabayashi, Ikuzo; and Sasaki, Tsutomu, to Nippon Kakon Kabushiki Kaisha. Successive transfer apparatus for surface treatment of elongate articles. 3,722,662, Cl. 198-82.000.

Wakamatsu, Shigeru: *See—*
Kajimoto, Tsunesuke; Wakamatsu, Shigeru; Nakanishi, Ryoji; Hara, Michio; Ohno, Kiyotaka; and Tsuji, Jiro, 3,723,486.

Wakeman, Alfred W.; and Kotuby, Paul M., to Risdon Manufacturing Company, The. Child-safe actuator-overcap. 3,722,748, Cl. 222-48.000.

Wakimoto, Saburo; Tugukuni, Hideyosi; Kano, Masafumi; Matsui, Yutaka; and Goto, Jogo, said Matsui and said Goto assors. to Takeda Chemical Industries, Ltd. and said Wakimoto, Tugukuni, and said Kano assors. to Dai Nippon Toryo Co., Ltd. Polyurethanes solube or compatible in water organic solvents and polyols. 3,723,372, Cl. 260-29.10r.

Walchle, David L., to Xomox Corporation. Molded L-shaped lenticular prosthesis. 3,722,003, Cl. 3-1.000.

Wald Manufacturing Company, Incorporated: *See—*
Humlong, Robert F., 3,722,930.

Waldecker, Donald E., to RAM Enterprises, Incorporated. Preliminary lubrication device. 3,722,623, Cl. 184-6.300.

Walden, Cecil C.; and Howard, Terence E., to Canadian Patents and Development Limited. Increasing oxygen transfer into aqueous solutions. 3,723,255, Cl. 195-109.000.

Walker, Douglas W.: *See—*
Stark, Robert E.; and Walker, Douglas W., 3,723,184.

Walker, Edward J.: *See—*
Zeldman, Maurice I.; Walker, Edward J.; and Gupta, Suresh K., 3,723,737.

Walker, Frank H.; and Craig, Richard W., to General Motors Corporation. Method and apparatus for transmission breathing. 3,722,321, Cl. 74-606.00r.

Walker, Lynn P., to Marathon Oil Company. Pyrolysis furnace having transverse mixing means in the end stacks. 3,723,067, Cl. 23-277.00r.

Walker, Nelson L.: *See—*
Johnson, Frank J.; Walker, Nelson L.; and Ross, John P., 3,723,283.

Wall, James A.; and Burke, Edward A., to United States of America, Air Force. Directionally sensitive radiation detector system using ionization chambers. 3,723,740, Cl. 250-83.60r.

Wall-Able Manufacturing Corporation: *See—*
Wallo, William H., 3,723,949.

Wallace, Samuel P. Tape take-up drive assembly. 3,722,822, Cl. 242-67.400.

Wallo, William H., to Wall-Able Manufacturing Corporation. Phono plug and method of making. 3,723,949, Cl. 339-177.00r.

Walsh, David P.; and Walsh, Joanne M. Multi-transport system. 3,722,948, Cl. 296-35.00a.

Walsh, George M., to Raytheon Company. Apparatus for differentiating between side lobe and main lobe returns in depth sounding systems. 3,723,952, Cl. 340-3.00r.

Walsh, Joanne M.: *See—*
Walsh, David P.; and Walsh, Joanne M., 3,722,948.

Walters, Ronald G.; and Zwitter, Thomas M. Variable speed pulse drive. 3,722,305, Cl. 74-125.500.

Walther, Bernhard, to VEB Filmfabrik. Cartridgem especially for film. 3,722,387, Cl. 95-31.00r.

Walther Buromaschinen GmbH: *See—*
Weskamp, Gerhard, 3,722,794.

Walther, William D., to Dayton Steel Foundry Company, The. Slider mount for fifth wheels. 3,722,914, Cl. 280-407.000.

Walton, Geurney Elden: *See—*
Arntz, Frederich Otto Wilhelm; and Walton, Geurney Elden, 3,722,038.

Walworth Company: *See—*
Murphy, Francis E.; and Kane, William L., 3,722,859.

Wang, Teh Po: *See—*
Schlenker, Juergen; and Wang, Teh Po, 3,723,106.

Ward & Son, Inc.: *See—*
Ward, H. Kenneth, 3,722,812.

Ward, H. Kenneth, to Ward & Son, Inc. Temperature control device. 3,722,812, Cl. 236-15.00a.

Warner & Swasey Company, The: *See—*
Harris, Earl D., 3,722,880.

Warner-Lambert Company: *See—*
Dawidowicz, Jan, 3,722,090.
Lane, George C.; Cartwright, Cyril A.; and Elmslie, Keith W., 3,723,276.

Warren, Christopher John Lewis; and Milross, John William. Apparatus for depositing viscous liquids. 3,722,758, Cl. 222-385.000.

Warren Fastener Corporation: *See—*
Ettinger, Donald H., 3,723,700.

Warwick Electronics Inc.: *See—*
Gharaibeh, Hashem M., 3,722,062.

Warzel, Fred M., to Phillips Petroleum Company. Batch-continuous reaction process in a fluidized bed. 3,723,395, Cl. 260-78.5cl.

Wasson, Burton Kendall, to Frosst, Charles E., & Co. 4-(3-Substituted amino)-2-hydroxypropoxy)-1,2,5-thiadiazoles. 3,723,443, Cl. 260-293.680.

Watanabe, Makoto. Apparatus for transferring highly viscous material. 3,723,020, Cl. 415-72.000.

Watanabe, Mikio: *See*—
Tanaka, Jun; Taguchi, Toshihiko; and Watanabe, Mikio, 3,723,160.

Watanabe, Tadashi; Murata, Kouichiro; Nanishi, Kiyoshi; and Yamamoto, Akira, to Kansai Paint Company, Limited. Urethanated unsaturated polyester resin and process for producing the same. 3,723,370, Cl. 260-22.0tn.

Watanabe, Tomoyoshi; and Jozuka, Masao, to Brother Kogyo Kabushiki Kaisha. Repeat spacing mechanism for typewriters. 3,722,654, Cl. 197-82.000.

Waters, Richard A.: *See*—
Meyer, Charles F.; Wieczorek, Robert A.; and Waters, Richard A., 3,723,767.

Watson, Roger W.: *See*—
Branen, William T.; and Watson, Roger W., 3,723,460.

Weatherby/Nasco, Inc.: *See*—
Chase, Myron C., 3,722,108.

Weatherholt, Dallas D.: *See*—
Prince, Zodell W.; Weatherholt, Dallas D.; and Trombatore, Adelene L., 3,723,219.

Weatherup, William Paul; and Campbell, Francis Robert, to Northern Electric Company, Limited. Cable connector. 3,723,946, Cl. 339-89.00r.

Weaver, Henry: *See*—
Boose, Robert Carl; Weaver, Henry; and Moore, Harry, 3,723,693.

Webb, Jimmy L.: *See*—
Hall, Walter L.; and Webb, Jimmy L., 3,723,465.

Webb, John M., to Mellen, Edward J., Jr. Expansible shell mold with refractory slip cover and the method of making same. 3,722,577, Cl. 164-366.000.

Webb, Robert L.: *See*—
Seiple, Ronald L.; Ashenden, Edward A.; and Webb, Robert L., 3,722,941.

Weber, Joseph; Zipoy, David M.; and Forward, Robert L., to Hughes Aircraft Company. Detector of dynamic gravitational force gradient fields. 3,722,284, Cl. 73-382.

Weber, Joseph, to Hughes Aircraft Company. Electrostatic coupled detector of dynamic gravitational force gradients. 3,722,285, Cl. 73-382.

Weber, Joseph, to Hughes Aircraft Company. Dynamic gravitational force gradient transducer. 3,722,286, Cl. 73-382.

Weber, Joseph, to Hughes Aircraft Company. Magnetic coupled detector of dynamic gravitational force gradients. 3,722,287, Cl. 73-382.

Weber, Joseph, to Hughes Aircraft Company. Electromagnetic coupled detector of dynamic gravitational force gradients. 3,722,288, Cl. 73-382.

Weber, Joseph, to Hughes Aircraft Company. Detector of dynamic gravitational force gradient fields. 3,722,289, Cl. 73-382.

Weber, Joseph; and Zipoy, David M., to Hughes Aircraft Company. Detector of dynamic gravitational force gradient fields. 3,722,290, Cl. 73-382.000.

Weber, Kent: *See*—
Reynolds, Richard W.; and Weber, Kent, 3,722,217.

Weber, Martin, to SWF Spezialfabrik For Autozubehor Gustav Rau GmbH. Lighting system for motor vehicles. 3,723,721, Cl. 240-7.10a.

Webster, M. C., Co., Ltd.: *See*—
Finkel, Henry, 3,722,120.

Wech, Robert J., to FMC Corporation. Bag machine. 3,722,376, Cl. 93-8.00r.

Wechsler, George: *See*—
Scheinderman, Abraham; Rudzitis, Karl; Brandsdorfer, Arthur; and Wechsler, George, 3,722,774.

Wehrli, Hans Ueli: *See*—
Jeger, Iskar; Wehrli, Hans Ueli; and Schaffner, Kurt, 3,723,418.

Weigel, John W.: *See*—
Komp, Richard J.; and Weigel, John W., 3,723,793.

Weigl, John W., to Xerox Corporation. Electrophoretic imaging apparatus including means to project an image at a liquid nip. 3,723,288, Cl. 204-300.000.

Weiner, David William: *See*—
Dellecker, Raymond Whyte; Greason, William Wallace, III; Hayden, Paul Ross; and Weiner, David William, 3,723,661.

Weinshenker, Ned M.: *See*—
Andersen, Niels H.; and Weinshenker, Ned M., 3,723,423.

Weisman, Manuel I.; and Klinger, Ira. Tooth percussion instrument. 3,722,100, Cl. 32-40.00r.

Weiss, Claus Dieter; and Rumpf, Jurg, to Ciba-Geigy Corporation. Herbicidal N-octahydro-1,2,4-methenopentalenyl-(5)-ureas. 3,723,415, Cl. 260-239.00a.

Welch, Arthur L. Transmission. 3,722,323, Cl. 74-681.000.

Weldy, Levon R.; and Yoder, Olen, Jr. Poultry loading apparatus. 3,722,477, Cl. 119-82.000.

Wells, Frank David: *See*—
Harrison, Lee, III; Wells, Frank David; and Honey, Francis J., 3,723,803.

Welte, Theodore J. R.: *See*—
Batey, Robert W.; and Welte, Theodore J. R., 3,723,865.

Weltronic Company: *See*—
Collom, Cletus J., 3,723,772.

Wenderoth, Karl, to Adlerwerke vorm. Heinrich Kleyer A.G. Carriage brake device. 3,722,633, Cl. 188-68.000.

Wendt, Fritz, KG: *See*—
Amrhein, Heinz G.; Stander, Herman; and Rosenow, Heinz, 3,722,145.

Wentzel, Peter; and Schulze, Edwald, to Siemens Aktiengesellschaft. Detector for detecting objects moving through a magnetic field established between coils of a D-C oscillator. 3,723,862, Cl. 324-41.000.

Wentzheimer, William Wayne: *See*—
Glessner, Alfred J.; and Wentzheimer, William Wayne, 3,723,292.
Glessner, Alfred J.; Wentzheimer, William Wayne; and Kress, Rene F., 3,723,293.

Wenzel, Lyle John, to Honeywell Inc. Locating arrangement for the moving contact carrier of a relay. 3,723,689, Cl. 200-166.0bc.

Werner, Helmut; and Stapp, Hans, to Enka Glanzstoff AG. Non-woven fleece of continuous filaments. 3,723,238, Cl. 161-169.000.

Wernikoff, Robert E.: *See*—
Pitegoff, Alexander D.; Wernikoff, Robert E.; and Cunningham, James E., 3,723,649.

Wertz, Keith J., to Larrain, Charles A. Timed cigarette dispenser. 3,722,742, Cl. 221-15.000.

Weskamp, Gerhard, to Walther Buromaschinen GmbH. Value input mechanism for ten key calculating machines. 3,722,794, Cl. 235-60.0tk.

Wessner, Harald: *See*—
Cap, Heinrich; Drasch, Josef; Miesbichler, Edgar; Pammer, Gottfried; Scheiber, Robert; and Wessner, Harald, 3,722,987.

West, Harold H.: *See*—
Klein, Harold T.; and West, Harold H., 3,722,601.

West, John Martin: *See*—
Boucher, Harold T.; Wheeler, Frank Arthur; and West, John Martin, 3,722,180.

West Point-Pepperell, Inc.: *See*—
Strother, Fred P.; and Blackstone, James O., Jr., 3,722,434.

Westenberg, Martin. Pneumatic conveying system. 3,722,544, Cl. 137-608.000.

Westendorp, Frans Frederik: *See*—
Buschow, Kurt Heinz Jurgen; Westendorp, Frans Frederik; and Wijn, Henricus Petrus Johannes, 3,723,197.

Westerhof, Pieter; and Morsink, Lucas, to U.S. Philips Corporation. 17β-hydroxy-17α-(2'-methallyl)9β, 10α-androsta-1,4,6-trien-3-one, methods of producing this compound and pharmaceutical compositions comprising said compound as an active ingredient. 3,723,482, Cl. 260-397.400.

Western Electric Company, Incorporated: *See*—
Bhattacharyya, Ranendra Kumar, 3,723,257.
Hotze, Robert E., 3,723,943.
Kumagai, Henry Yasuo, 3,723,838.
Smith, George T., 3,723,635.

Western Gear Corporation: *See*—
Aplet, Everett Lloyd; and Reynolds, Thomas J., 3,722,769.

Westgate-California Foods, Inc.: *See*—
McConville, Thomas P., 3,723,136.

Westhaver, Lawrence A. Electronic tuning device for visual tuning of stringed instruments. 3,722,353, Cl. 84-454.000.

Westinghouse Electric Corporation: *See*—
Brandt, Gerald B., 3,722,982.
Spisak, Andrew J.; and Nagoda, Louis E., 3,723,794.

Westvaco Corporation: *See*—
Blonsky, Joseph E., 3,722,706.
Marton, Joseph; and Marton, Terezia, 3,723,164.

Weterings, Cornelis A. M.: *See*—
Eurlings, Jacobus J. M. G.; Geus, John W.; and Weterings, Cornelis A. M., 3,723,353.

Wetter, Jakob, to Ferag, Fehr & Reist AG. Apparatus for opening folded, bound, multiple-sheet paper products. 3,722,877, Cl. 270-57.000.

Whalen, James Joseph, to Johns-Manville Corporation. High tensile strength chemical resistant reinforced asbestos yarn products. 3,722,201, Cl. 57-144.000.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Heat sinking of semiconductor integrated circuit devices. 3,723,833, Cl. 317-234.00r.

Wheaton, Harold L.; and Bishop, Thomas H., to TRW Inc. Method of preventing dross formation during remelting. 3,723,097, Cl. 75-10.00v.

Wheeler, Frank Arthur: *See*—
Boucher, Harold T.; Wheeler, Frank Arthur; and West, John Martin, 3,722,180.

Whelton, Robert M.: *See*—
Podell, Jack F.; and Whelton, Robert M., 3,723,258.

Whipple, William D.; and Gifford, Howard W., to Prelude Corporation. Marine hauling apparatus. 3,722,126, Cl. 43-6.500.

Whirlpool Corporation: *See*—
Schmitz, Joseph F., 3,722,024.

Whitacre, Foster E.: *See*—
Bogart, Harold N.; Hopwood, Norman W., Jr.; Pearson, Archie A.; and Whitacre, Foster E., 3,722,257.

White, George A.: *See*—
Davidson, Arthur R.; Haubner, John E.; and White, George A., 3,722,401.

Whitehouse, Harper John: *See*—
Speiser, Jeffrey M.; and Whitehouse, Harper John, 3,723,916.

Whiteley, Thomas B., to United States of America, Navy. Frequency to voltage converter. 3,723,891, Cl. 329-103.000.

Whitley, William P., Jr. Torsion bar suspension system for tandem trailer wheels. 3,722,908, Cl. 280-124.00b.
Whitney, Joel G.: *See—*
Lee, Kyu Tai; and Whitney, Joel G., 3,723,504.
Whitney, W. A., Corporation: *See—*
Brolund, Theodore F.; and Kuchar, William E., 3,722,337.
Whittemore, Edward William: *See—*
Malcik, Frank John; Whittemore, Edward William; and Clark, John Patrick, 3,722,701.
Whitye Research Tool Co.: *See—*
Koch, Ulrich H.; Matousek, Stephen; and Soderlund, Gary, 3,722,856.
Wickman Machine Tool Sales Limited: *See—*
Gilbert, Harold James, 3,722,333.
Wieboldt, Richard A. Golf club swing training device. 3,722,890, Cl. 273-186.00a.
Wiechert, Rudolf: *See—*
Laurent, Henry; Wiechert, Rudolf; and Kolb, Karl Heinz, 3,723,484.
Wieczorek, Robert A.: *See—*
Meyer, Charles F.; Wieczorek, Robert A.; and Waters, Richard A., 3,723,767.
Wiesner, Karel, to American Home Products Corporation. 4,10-(Methaniminomethano) phenanthrene derivatives. 3,723,437, Cl. 260-285.000.
Wijn, Henricus Petrus Johannes: *See—*
Buschow, Kurt Heinz Jurgen; Westendorp, Frans Frederik; and Wijn, Henricus Petrus Johannes, 3,723,197.
Wikkerink, Lance A.; and Wikkerink, Lee R., to Lanson Industries, Inc. Process for making floor mat switches. 3,722,086, Cl. 29-622.000.
Wikkerink, Lee R.: *See—*
Wikkerink, Lance A.; and Wikkerink, Lee R., 3,722,086.
Wilbrecht, Lester L. Dust cover for switches. 3,723,692, Cl. 200-168.00h.
Wilding, Morris D.: *See—*
Miller, David M.; and Wilding, Morris D., 3,723,407.
Wiles, Jerald R.: *See—*
Loomis, Clifford R., Jr.; Wiles, Jerald R.; and Newton, Russell A., 3,722,656.
Wilfert, Karl, to Daimler-Benz Aktiengesellschaft. Foot pedal for motor vehicle. 3,722,320, Cl. 74-560.000.
Wilhelm, Frederick C., to Universal Oil Products Company. Hydrocarbon isomerization process. 3,723,554, Cl. 260-668.00a.
Wilhelm, Frederick C., to Universal Oil Products Company. Hydrocarbon isomerization process. 3,723,556, Cl. 260-668.00a.
Wilhelmi, Julius B., to TRW Inc. Caster glide. 3,722,026, Cl. 16-42.000.
Wilke, Raud A., to Koehring Company. Control valve. 3,722,541, Cl. 137-596.000.
Willems, Jozef Frans, to Agfa-Gevaert. Method for developing silver halide emulsions. 3,723,117, Cl. 96-29.000.
Williams, Charles R.: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joel; and Williams, Charles R., 3,723,381.
Williams, Earl P.: *See—*
Field, Nathan D.; and Williams, Earl P., 3,723,375.
Williams, Lucien C.: *See—*
Gacs, Peter T.; and Williams, Lucien C., 3,722,017.
Williams, Ralph L. Article conveyor system. 3,722,661, Cl. 198-76.000.
Wills, Walter R.: *See—*
Komline, Thomas R., Sr.; and Wills, Walter R., 3,723,712.
Wilson, Christopher Guy Scott: *See—*
Davies, Guy Edward; and Wilson, Christopher Guy Scott, 3,722,521.
Young, Francis Graham; and Wilson, Christopher Guy Scott, 3,722,278.
Wilson, Fred A.; and Sprague, Lindol H., to Dover Corporation. Cap and locking means therefor. 3,722,549, Cl. 138-89.000.
Wilson, Harold P., to Vulcan Materials Company. Electrodialytic production of stannic oxide sol. 3,723,273, Cl. 204-180.00p.
Wilson, Robert G.: *See—*
Seliger, Robert L.; and Wilson, Robert G., 3,723,733.
Winberg, Paul N.; and Winberg, Robert W. Intermediate clamp for contour seamer. 3,722,437, Cl. 112-121.120.
Winberg, Robert W.: *See—*
Winberg, Paul N.; and Winberg, Robert W., 3,722,437.
Winkler, Alfred, to Agfa-Gevaert Aktiengesellschaft. Single-lens reflex camera. 3,722,388, Cl. 95-31.0ac.
Winstead, Thomas W. Method for reclaiming the selvage of foamed thermoplastic web. 3,723,582, Cl. 264-37.000.
Winter, Gerhard: *See—*
Mansmann, Manfred; Winter, Gerhard; Pampus, Gottfried; Schnoring, Hildegard; and Schon, Nikolaus, 3,723,609.
Wirsching, Robin F.: *See—*
Markel, Arthur L.; and Wirsching, Robin F., 3,722,689.
Wirsching, Robin F., to Reynolds Submarine Services Corporation. Sea-surface oil extraction. 3,722,688, Cl. 210-241.000.
Wirth, Joseph G., to General Electric Company. Certain fluorescent 2-(2-hydroxy-phthalimidomethyl-phenyl)-benzothiazol. 3,723,449, Cl. 260-304.000.
Wirtz, Larry K.: *See—*
Clary, John G.; and Wirtz, Larry K., 3,723,673.
Wise, Lowell G., to Sherwin-Williams Company, The. Method of electrocoating using a flowing mercury cathode. 3,723,274, Cl. 204-181.000.
Wise, Warren M., to Corning Glass Works. Bicarbonate ion sensitive electrode. 3,723,281, Cl. 204-195.001.
Wissler, Bernhard; and Dietsche, Erich, to Dietsche, Roman, Firma. Brush. 3,723,015, Cl. 401-278.000.
Withrow, David A., to Production Machinery Corporation. Apparatus and method for leveling metal strip. 3,722,251, Cl. 72-294.000.
Wittcoff, Harold A.: *See—*
Nordgren, Robert; Jones, Duane A.; and Wittcoff, Harold A., 3,723,408.
Witteles, Abraham A., to Singer Company, The, mesne. Radiation method for determining semiconductor stability and reliability. 3,723,873, Cl. 324-158.00t.
Wittern, Francis A.; and Woodley, Warren D., said Woodley assor. to Fawn Engineering Corporation. Husbandry apparatus. 3,722,475, Cl. 119-51.110.
Wogman, Ned A.; Perkins, Richard W.; Rieck, Henry G.; and Cooper, John A., to United States of America, Atomic Energy Commission. In-situ neutron activation. 3,723,727, Cl. 260-83.300.
Wojcik, Edward P.: *See—*
Meier, William A.; and Wojcik, Edward P., 3,722,669.
Wolber, William G.: *See—*
Mueller, Rolf K.; and Wolber, William G., 3,723,966.
Wolf, Gerrit, to U.S. Philips Corporation, mesne. Circuit arrangement for receiving high-frequency electric signals. 3,723,917, Cl. 333-32.000.
Wolf, Peter: *See—*
Goetze, Walter; Wolf, Peter; Schulz, Gerhard; and Luedemann, Horst, 3,723,530.
Wolf, Robert L.; and McGain, Rodney, to Texaco Inc., mesne. Reaction propulsion engine and method of operation. 3,722,220, Cl. 60-267.000.
Wolf-Dieter Klink: *See—*
Fiala, Ernst, 3,722,528.
Wolfe, James R.: *See—*
Borg, Richard J.; Lai, David Y. F.; Riley, Neil R.; and Wolfe, James R., 3,723,359.
Wolff, Charles H.: *See—*
Kuriz, Hobart L., Jr.; Smith, Glenn H.; and Wolff, Charles H., 3,723,975.
Woltjer, David: *See—*
Shaltis, Robert J.; and Woltjer, David, 3,722,683.
Wood, Craig K.: *See—*
Kaiser, Donald W.; and Wood, Craig K., 3,723,543.
Wood, Edwin L.; and Gibson, Roger E., to Eastman Kodak Company. Stabilizer system for cellulose ester plastics. 3,723,147, Cl. 106-176.000.
Wood, Prentice J., to Mead Corporation, The. Carrier for flanged articles. 3,722,945, Cl. 294-87.200.
Woodley, Clifford E.: *See—*
Woodley, Clifford E.; and Carter, Herbert S. (said Carter assor. to said), 3,722,430.
Woodley, Clifford E.; and Carter, Herbert S., said Carter assor. to said Woodley, Clifford E. Pallets. 3,722,430, Cl. 108-58.000.
Woodley, Warren D.: *See—*
Wittern, Francis A.; and Woodley, Warren D., 3,722,475.
Woodling, George V. Fluid pressure device having outside-inside rotary valve means. 3,722,546, Cl. 137-625.210.
Woodling, George V. Fluid seal means surrounding bearing means. 3,722,966, Cl. 308-187.100.
Woodling, George V. Anti-friction orbital and rotary device. 3,723,032, Cl. 418-61.000.
Woolley, Edward R.: *See—*
Cochran, Alastair J.; Jepson, John W.; Woolley, Edward R.; and Lynch, Francis Des., 3,722,887.
Worline, Paul W., to Acraloc Corporation. Vacuum nozzle. 3,722,558, Cl. 141-65.000.
Worthington Corporation: *See—*
Berman, Merril, 3,723,019.
Potter, Olin E.; and Tomasi, Biagio J., 3,722,187.
Wright, George H.; and Phelan, Charles S., to Shur-Lok Corporation. Sandwich panel insert and installation holder assembly and method of handling. 3,722,671, Cl. 206-65.00k.
Wright, Herschel E., to Beckman Instruments, Inc. Centrifuge rotor with removable tunnion pins. 3,722,791, Cl. 233-26.000.
Wright, William H., to Zumbiel, C. W., Company, The. Beverage bottle carrier. 3,722,738, Cl. 220-113.000.
Wu, Ching Yong; and Swift, Harold E., to Goodrich, B. F., Company, The. Cyclotrimerization of butadiene using nickel catalyst. 3,723,553, Cl. 260-666.00b.
Wunderlin, Max, to Turmix AG. Humidifier. 3,723,707, Cl. 219-276.000.
Wurlitzer Company, The: *See—*
Pfitzer, Robert L.; and Drakes, Russell J., 3,722,649.
Wyatt, Gerald A.; and Anderson, Gail A., to Minnesota Mining and Manufacturing Company. Electrical component. 3,723,948, Cl. 339-99.00r.
Wynn, John F., Jr., to United States of America, Navy. Submarine towing system. 3,722,452, Cl. 114-235.00b.
Xerox Corporation: *See—*
Egnaczak, Raymond Keith, 3,722,993.
Fisher, Donald J., 3,722,018.
Goffe, William L., 3,723,110.

Goffe, William L., 3,723,113.
Hagenbach, Robert J.; and Madrid, Robert W., 3,723,114.
Johnson, Wendell C.; Gomez, Nicolas G.; and Foret, Claude H., 3,722,083.
Komp, Richard J.; and Weigel, John W., 3,723,793.
Luebbe, Ray H., Jr., 3,723,112.
Perreault, Donald A., 3,723,640.
Stoffel, James C.; and Brock, John L., 3,722,471.
Weigl, John W., 3,723,288.

Xomox Corporation: *See—*
Walchle, David L., 3,722,003.

Yale, Harry L.; and Bernstein, Jack, to Squibb, E. R., & Sons, Inc. Dibenzooxazepines and dibenzothiazepines. 3,723,463, Cl. 260-327.00b.

Yamada, Eiji. Bottle cap structure and method for making the same. 3,722,729, Cl. 215-41.000.

Yamada, Takashi: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Yamada, Yasuo, to Bayer Aktiengesellschaft. Synergistic fungicidal composition for the control of diseases of rice plants. 3,723,618, Cl. 424-225.000.

Yamaguchi, Ken: *See—*
Tanaka, Katsunobu; Kimura, Kazu; and Yamaguchi, Ken, 3,723,248.

Yamaguchi, Masahiro: *See—*
Araya, Kenji; Enomoto, Akihiro; Nishina, Akira; and Yamaguchi, Masahiro, 3,722,490.

Yamaguchi, Nobuharu: *See—*
Nakanishi, Michio; Muro, Tomio; Imamura, Hiroshi; and Yamaguchi, Nobuharu, 3,723,476.

Yamaguchi, Yoshihiro: *See—*
Yamamoto, Shunji; Fujita, Tatsu; Yamaguchi, Yoshihiro; and Noguchi, Masataka, 3,722,245.

Yamamoto, Akira: *See—*
Watanabe, Tadashi; Murata, Kouichiro; Nanishi, Kiyoshi; and Yamamoto, Akira, 3,723,370.

Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, to Sumitomo Chemical Company, Ltd. 2-Aminomethyl-3-halophenylindoles. 3,723,461, Cl. 260-36.150.

Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, to Sumitomo Chemical Company, Ltd. Process for manufacturing nitrobenzodiazepine derivativs. 3,723,464, Cl. 260-326.150.

Yamamoto, Michihiro: *See—*
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isami; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,461.
Yamamoto, Hisao; Inaba, Shigeho; Okamoto, Tadashi; Hirohashi, Toshiyuki; Ishizumi, Kikuo; Yamamoto, Michihiro; Maruyama, Isamu; Mori, Kazuo; and Kobayashi, Tsuyoshi, 3,723,464.

Yamamoto, Shunji; Fujita, Tatsu; Yamaguchi, Yoshihiro; and Noguchi, Masataka, to Kobe Steel, Limited. Hydrostatically operated extruding machine. 3,722,245, Cl. 72-60.000.

Yamamoto, Takeshi: *See—*
Kato, Shigeki; and Yamamoto, Takeshi, 3,723,142.

Yamanouchi, Teruo: *See—*
Kinjo, Kikuo; Yamanouchi, Teruo; Kondo, Eiichi; and Wada, Yasuo, 3,723,116.

Yamasaki, Hiroo; and Kurita, Yoshio, to Yokogawa Electric Works, Ltd. Flow measuring apparatus. 3,722,273, Cl. 73-194.00b.

Yamashita, Maki: *See—*
Kobayashi, Tatsuo; Yamashita, Maki; and Takeuchi, Hideo, 3,722,382.

Yamawaki, Kensaku: *See—*
Kurita, Kiyoshi; Shigematsu, Hiroshi; Koyama, Tomyuki; Endo, Souichiro; and Yamawaki, Kensaku, 3,723,222.

Yanagihara, Tadahisa: *See—*
Ono, Isao; Yanagihara, Tadahisa; Okada, Hiroaki; and Uotani, Takeshi, 3,723,510.

Yancey, Paul Joseph, to Union Carbide Corporation. Hydrotherman process for growing crystals having the structure of beryl in highly acid chloride medium. 3,723,337, Cl. 252-301.40f.

Yang, Hung Han: *See—*
Hovermale, Ralph Allen; Ostapchenko, George Joseph; and Yang, Hung Han, 3,723,583.

Yano, Akira; and Kimura, Tsutomu, to Fuji Photo Film Co., Ltd. Method of automatically cutting rolled photographic paper web. 3,723,122, Cl. 96-48.00r.

Yano, Tetsuo; Itoh, Noboru; Iguchi, Sigeru; Ueda, Bunzo; and Kanada, Eiji, to Mitsubishi Paper Mills, Inc. Multi-layered color photographic material. 3,723,127, Cl. 96-74.000.

Yashiro, Katsuji: *See—*
Asou, Setsuro; Sugawara, Junichi; Tanso, Tukuhei; and Yashiro, Katsuji, 3,722,318.

Yasumatsuya, Noboru, to Matsushita Electric Industrial Co., Ltd. Vertical deflection device utilizing rectifying means for deflection control. 3,723,804, Cl. 315-27.0gd.

Yates, Paul C.: *See—*
Kirkland, Joseph J.; and Yates, Paul C., 3,722,181.

Yazaki, Seiichi, to Fujimoto Company Ltd., The. Nursing device. 3,722,728, Cl. 215-11.00b.

Yoda, Tadashi: *See—*
Muraki, Kiichi; and Yoda, Tadashi, 3,722,444.

Yoder, Olen, Jr.: *See—*
Weldy, Levon R.; and Yoder, Olen, Jr., 3,722,477.

Yokobayashi, Yasuyuki; and Masuda, Kazuo, to Hayashibara Company. Production of alpha-1,6-glucosidase. 3,723,253, Cl. 195-66.00r.

Yokogawa Electric Works, Ltd.: *See—*
Yamasaki, Hiroo; and Kurita, Yoshio, 3,722,273.

Yokomichi, Koji: *See—*
Kokubo, Ryo; Yokomichi, Koji; Takakuwa, Yasuo; and Takahashi, Kozo, 3,723,430.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Ebata, Hiroyuki, 3,722,672.

Yoshida, Masatoshi; and Hirai, Minoru, to Toho Beslon Kabushiki Kaisha. Method for preparing plasticized granular polymers containing acrylonitrile as the main component. 3,723,378, Cl. 260-30.8dm.

Yoshida, Toshiichi; Nakamura, Takashi; and Ohkubo, Kinji, to Fuji Photo Film Co., Ltd. Process for preparing a lithographic printing plate containing an olephilic dimer image of an oxidized silver halide developing agent. 3,723,119, Cl. 96-33.000.

Yoshimine, Masao: *See—*
Hatch, Melvin J.; Yoshimine, Masao; Smith, Hugh B.; and Schmidt, Donald L., 3,723,386.

Yoshimura, Kenziro: *See—*
Kudo, Masao; Okita, Akihiko; Yoshimura, Kenziro; and Niwa, Nobuo, 3,722,463.

Yoshinaga, Fumihiro: *See—*
Kubota, Koji; Kamijo, Hirotaka; Onoda, Takiko; Yoshinaga, Fumihiro; and Okumura, Shinji, 3,723,249.

Yoshino, Eiichi: *See—*
Takemura, Satoshi; Yoshino, Eiichi; Honda, Toshio; Kubota, Eishi; and Fukuura, Yukio, 3,723,239.

Yoshitake, Hiroshi: *See—*
Ito, Ken; Terao, Shinichiro; Sugahara, Hirotaka; Yamada, Takashi; Dohgane, Iwao; Chinuki, Takashi; Yoshitake, Hiroshi; and Fujino, Hidekazu, 3,723,580.

Yoshitomi Pharmaceutical Industries, Ltd.: *See—*
Nakanishi, Michio; Arimura, Katsuo; and Ao, Hideki, 3,723,442.
Nakanishi, Michio; Muro, Tomio; Imamura, Hiroshi; and Yamaguchi, Nobuharu, 3,723,476.

Young, Dale Travis: *See—*
Rowe, Harrison Edward; and Young, Dale Travis, 3,723,921.

Young, Francis Graham; and Wilson, Christopher Guy Scott, to National Research Development Corporation. Flow meter. 3,722,278, Cl. 73-228.000.

Young, George M. Variable load auger apparatus. 3,722,715, Cl. 214-17.00d.

Young, James E., to Combustion Engineering, Inc. Hot top securing system. 3,722,848, Cl. 249-197.000.

Yueh, Mao H., to General Mills, Inc. Mixed derivatives of polygalactomannans and process of preparing same. 3,723,409, Cl. 260-209.00r.

Yuminaka, Takeo; Inuzuka, Isao; and Iwasaka, Tatsuo, to Hitachi, Ltd. Elevator control system. 3,722,628, Cl. 187-29.00r.

Zabarilo, Oleg Semenovich: *See—*
Paton, Boris Evgenievich; Tseltkov, Alexandr Ivanovich; Lakomsky, Viktor Iosfiovich; Grigorenko, Georgy Mikhailovich; Zabarilo, Oleg Semenovich; Melnik, Gary Alexandrovich; Ponomarev, Nikolai Alexeevich; Verkhovtsev, Emily Vladimirovich; and Bakumenko, Serei Panteleevich, 3,723,630.

Zachos, Elias B.: *See—*
Castrucci, Paul P.; Grochowski, Edward G.; Hess, Martin S.; and Zachos, Elias B., 3,723,200.

Zahn, Paul, to Messerschmitt-Bolkow Blohm GmbH. Thermoelectric device. 3,723,189, Cl. 136-205.000.

Zandberg, Paul I.: *See—*
Colman, Albert J.; Zandberg, Paul I.; and Taylor, Harles F., 3,722,097.

Zeile, Karl: *See—*
Freter, Kurt; and Zeile, Karl, 3,723,440.

Zeiringer, Rudolf: *See—*
Harnoncourt, Karl; and Zeiringer, Rudolf, 3,723,280.

Zeischegg, Walter, to Hefendehl, Hans Friedrich. Plastic box furniture. 3,722,971, Cl. 312-107.000.

Zeldman, Maurice I.; Walker, Edward J.; and Gupta, Suresh K., to North America Rockwell Corporation. Infrared detection and control device. 3,723,737, Cl. 250-83.30h.

Zelenko, Harry. Lock assembly for litter bins. 3,722,236, Cl. 70-78.000.

Zeller, Paul: *See—*
Hegedus, Balthasar; and Zeller, Paul, 3,723,514.

Zenith Radio Corporation: *See—*
Adler, Robert; DeVries, Adrian J.; and Dias, Fleming, 3,723,915.
Adler, Robert, 3,723,919.
Carlson, Reuben C., 3,723,882.
Kloba, Anthony; and Maskell, Roy, 3,723,857.
Pedersen, Arne R., 3,723,906.

Zergenyi, Janos; and Habicht, Ernst, to Ciba-Geigy Corporation. Duiretic and aluretic compositions and method with 3-tertiary amino propionyl-benzofuran-2-carboxylic acids. 3,723,619, Cl. 424-248.000.

Zeunen, Barthel; Grace, Rex C.; and Dunn, Alire R., to Capitol Reproductions, Inc. Photographic exposure apparatus. 3,723,001, Cl. 355-84.000.

Zhdanov, Konstantin Ivanovich; Tomilin, Alexandr Grigorievich; Polyakov, Anatoly Mikhailovich; Luznin, Andrei Alexandrovich; Kaimov, Gennady Petrovich; Vasiliev, Jort Nikolaevich; Sheremet, Nilolai Andreevich; Bekhli, Jury Georgievich; and Federov, Evgeny etrovich. Gas-turbine plant. 3,722,215, Cl. 60-39.320.

Zhekhov, Nikolai Nikolaevich: *See*—
Khitro, Emmanuil Lipovich; and Zhekhov, Nikolai Nikolaevich, 3,723,674.

Zhukevich-Stosha, Evgeny Alexandrovich; Verderevsky, Vadim Anatolievich; Cherednichenko, Genrikh Moiseevich; Dobychin, Fedor Nikolaevich; Lakernik, Rafail Moiseevich; Svidovsky, Felix Grigorievich; and Shapiro, Aron Isaakovich. Device for rolling corrugate tubular parts. 3,722,249, Cl. 72-187.000.

Ziebarth, Paul E.; and Ritter, Reinhold, to Langhein & Co. Index commutator means for oscillating barrels. 3,723,284, Cl. 204-213.000.

Ziemek, Gerhard; Schatz, Friedrich; and Aust, Karoly, to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Apparatus for making electrical heating mats. 3,722,777, Cl. 228-4.000.

Zimmer, Gerhard: *See*—
Erlemann, Gustav; Sander, Manfred; and Zimmer, Gerhard, 3,723,616.

Zipoy, David M.: *See*—
Weber, Joseph; Zipoy, David M.; and Forward, Robert L., 3,722,284.
Weber, Joseph; and Zipoy, David M., 3,722,290.

Zirkle, Charles L.: *See*—
Kaiser, Carl; and Zirkle, Charles L., 3,723,441.

Ziver, Caro M.: *See*—
Frazier, John F.; and Ziver, Caro M., 3,723,935.

Zocholl, Stanley E., to I-T-E Imperial Corporation. Direct acting overcurrent system for high voltage circuit breakers. 3,723,818, Cl. 317-36.0td.

Zoecon Corporation: *See*—
Diekman, John D.; and Siddall, John B., 3,723,447.
Siddall, John B.; and Henrick, Clive A., 3,723,462.
Siddall, John B.; and Hendrick, Clive A., 3,723,467.

Zomeworks Corporation: *See*—
Baer, Stephen C., 3,722,153.

Zucci, Mark L. Retractable side frame for flat bed trailer. 3,722,947, Cl. 296-26.000.

Zucker, Fredric E.; Murphy, James P.; Smith, Lawrence J.; and Kaswer, Joseph, Jr., to Pitney-Bowes, Inc. Credit authorization system terminal. 3,723,655, Cl. 179-2.0dp.

Zumbiel, C. W., Company, The: *See*—
Wright, William H., 3,722,738.

Zurek, James W.; and Fulghum, David A., to International Harvester Company. Self-actuated mechanism for braking a driven member upon discontinuation of drive thereto. 3,722,642, Cl. 192-8.00r.

Zurstadt, Herbert J., to Dresser Industries, Inc., mesne. Micro-torque potentiometer. 3,723,936, Cl. 338-40.000.

Zweifel, Karl: *See*—
Loepfe, Erich; Keller, Walter; and Zweifel, Karl, 3,723,933.

Zweig, Gilbert, to Pitney-Bowes, Inc. Apparatus for creating an electrostatic latent image by charge modulation. 3,722,992, Cl. 355-3.000.

Zwitter, Thomas M.: *See*—
Walters, Ronald G.; and Zwitter, Thomas M., 3,722,305.

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 27TH DAY OF MARCH, 1973

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Besser, John E. Inhibiting polymerization of acrylic and methacrylic acids and esters thereof. T908,001, 3–27–73, Cl. 260—486 R.

Breitel, Robert C.: *See*—
Carey, James E., Breitel, and Moore. T908,010.

Carey, James E., R. C. Breitel, and R. J. Moore. Process for curing epoxy resin laminates in inert hot liquid medium. T908,010, 3–27–73, Cl. 117—119.6.

Cummins, Earl W. Preparation of thiolhydroxamate carbamates. T908,004, 3–27–73, Cl. 260—453.

Du Pont de Nemours, E. I., & Co.: *See*—
Moore, Edward J. T908,007.
Witsiepe, William K. T908,011.

Eastman Kodak Co.: *See*—
Rissberger, Arthur C., Jr., Richards, and Runions. T908,006.

Gott, Paul G.: *See*—
Martin, James C., and Gott. T908,009.

Joyner, Frederick: *See*—
McConnell, Richard L., Weemes, and Joyner. T908,008.

Kokorudz, Michael. Process for stabilized polyethers. T908,003, 3–27–73, Cl. 260—615 A.

Loyd, Calvin D. Method of bonding a member to a thin plate. T908,002, 3–27–73, Cl. 29—470.3.

Martin, James C., and P. G. Gott. Process of preparing substituted p-(hydroxyphenyl) acetic acids. T908,009, 3–27–73, Cl. 260—521.

McConnell, Richard L., B. A. Weemes, and F. Joyner. Cross-linked polyolefins. T908,008, 3–27–73, Cl. 260—88.250.

Moore, Edward J., to E. I. du Pont de Nemours & Co. Process and apparatus for extruding polyolefins. T908,007, 3–27–73, Cl. 264—209.

Moore, Robert J.: *See*—
Carey, James E., Breitel, and Moore. T908,010.

Richards, George J.: *See*—
Rissberger, Arthur C., Jr., Richards, and Runions. T908,006.

Rissberger, Arthur C., Jr., G. J. Richards, and A. C. Runions, to Eastman Kodak Co. Package for transparency slides. T908,006, 3–27–73, Cl. 40—106.1.

Soboczenski, Edward J. Control of plant parasitic nematodes with 2-benzimidazole-carbamic acid, methyl ester. T908,005, 3–27–73, Cl. 424—273.

Weemes, Boyle A.: *See*—
McConnell, Richard L., Weemes, and Joyner. T908,008.

Witsiepe, William K., to E. I. du Pont de Nemours & Co. Polyisocyanate modified thermoplastic polyester compositions. T908,011, 3–27–73, Cl. 260—75.

LIST OF DESIGN PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF MARCH, 1973

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Anderson, Emmett R.: *See*—
O'Neil, Emmett L., and Anderson. 226,578.

Associated Mills Inc.: *See*—
Grube, Clifford E. 226,586.

Avery Products Corp.: *See*—
Noack, William L. 226,592.

Benty, John L., and D. Defano, to Clairol Inc. Case for electric skin hygiene brush. 226,588, 3–27–73, Cl. D87—10.

Boehm, Rudolph A.: *See*—
Skyer, Robert A., Bowman, Zurek, Boehm, and Deschamps. 226,558.

Bowman, George E.: *See*—
Skyer, Robert A., Bowman, and Fulghum. 226,557.
Skyer, Robert A., Bowman, Zurek, Boehm, and Deschamps. 226,558.

Bristol-Myers Co.: *See*—
Keldmann, Erik. 226,587.

Brodsky, Louis, to E. R. Squibb & Sons, Inc. Container stopper or the like. 226,554, 3–27–73, Cl. D9—264.

Burgeson, Oscar B., to The Stanley Works. Cutting tool. 226,548, 3–27–73, Cl. D8—58.

Casad, Donald E. Beverage glass. 226,573, 3–27–73, Cl. D36—8.

Clairol Inc.: *See*—
Benty, John L., and Defano. 226,588.

Consul Gesellschaft mit beschrankter: *See*—
Weissmann, Peter. 226,580.

Croyle, Jack V.: *See*—
Swett, James B., and Croyle. 226,576.

Damon Corp.: *See*—
Munn, David E., Mello, and Maddestra. 226,572.

Dart Industries Inc.: *See*—
Swett, James B., and Croyle. 226,576.

Defano, Dominic: *See*—
Benty, John L., and Defano. 226,588.

Deschamps, Joseph P.: *See*—
Skyer, Robert A., Bowman, Zurek, Boehm, and Deschamps. 226,558.

Diorio, Anthony R.: *See*—
Garbely, Rudolph J., and Diorio. 226,564.

Downey, Martin W.: *See*—
Jones, Lloyd K., and Downey. 226,561.

Egan, Robert: *See*—
Sullivan, Leroy J. 226,560.

Endura Appliance Corp.: *See*—
Freedman, Robert N. 226,549.

Fernandez, Mario F., and R. L. Rydeen, to Toro Manufacturing Corp. Riding mower body. 226,574, 3–27–73, Cl. D40—1.

Fernandez, Mario F., and R. L. Rydeen, to Toro Manufacturing Corp. Steering wheel for riding mowers. 226,575, 3–27–73, Cl. D40—1.

Freedman, Robert N., to Endura Appliance Corp. Housing for electric shears. 226,549, 3–27–73, Cl. D8—61.

Fulghum, David A.: *See*—
Skyer, Robert A., Bowman, and Fulghum. 226,557.

Gaddis, Robert L.: *See*—
Sullivan, Leroy J. 226,560.

Gaddis, Marie L.: *See*—
Sullivan, Leroy J. 226,560.

Garbely, Rudolph J., and A. R. Diorio. Modular automatic electroplating equipment. 226,564, 3–27–73, Cl. D26—1.

General Electric Co.: *See*—
Mellyn, Lawrence P. 226,550.

Glaberson, Martin, to Warner-Lambert Co. Dispenser for razor blade cartridges. 226,553, 3–27–73, Cl. D9—189.

Goto, Kenjiro, to Mansei Kogyo Kabushiki Kaisha. Cigarette lighter. 226,581, 3–27–73, Cl. D48—27.

Grube Clifford E., to Associated Mills Inc. Heater housing for electric hair curlers. 226,586, 3–27–73, Cl. D86—10.

Hardt, William G. Prefabricated fireplace. 226,563, 3–27–73, Cl. D23—94.

Hermann, Thomas J.: *See*—
Klepa, Peter P., and Hermann. 226,565.
Klepa, Peter P., and Hermann. 226,566.

Hollingsworth, Alfred D. Stool or similar article. 226,545, 3–27–73, Cl. D6—34.

Horgan, William J., Jr. Door. 226,556, 3–27–73, Cl. D13—1.

Hughes Aircraft Co.: *See*—
Klepa, Peter P., and Hermann. 226,565.
Klepa, Peter P., and Hermann. 226,566.

Iannini, Robert E., to Rid-O-Ray Inc. Lantern and insect killer and post therefor. 226,582, 3–27–73, Cl. D48—31.

International Harvester Co.: *See*—
Skyer, Robert A., Bowman, and Fulghum. 226,557.
Skyer, Robert A., Bowman, Zurek, Boehm, and Deschamps. 226,558.

Iso, Naoyuki. Hanger for display package. 226,547, 3–27–73, Cl. D6—252.

Jones, Lloyd K., and M. W. Downey, to Rockwell Maufacturing Co. Handle for plumbing fittings. 226,561, 3–27–73. Cl. D23—28.

Keldmann, Erik, to Bristol-Myers Co. A hair curler. 226,587, 3–27–73, Cl. D86—10.

Klepa, Peter P., and T. J. Hermann, to Hughes Aircraft Co. Subscriber terminal central unit. 226,565, 3–27–73, Cl. D26—5.

Klepa, Peter P., and T. J. Hermann, to Hughes Aircraft Co. Subscriber terminal console. 226,566, 3–27–73, Cl. D26—5.

Koch, Samuel J. Combined ashtray and cigarette lighter or similar article. 226,584, 3–27–73, Cl. D85—2.

Le-Cheminant, Eric. Grease applicator. 226,591, 3–27–73, Cl. D52—2.

Maddestra, Robert: *See*—
Munn, David E., Mello, and Maddestra. 226,572.

Mansei Kogyo Kabushiki Kaisha: *See*—
Goto, Kenjiro. 226,581.

Manuel, Victor. Necklace. 226,579, 3–27–73, Cl. D45—16.

McQuisten, Samuel R.: *See*—
Svehla, Paul W., and McQuisten. 226,589.

Mellyn, Lawrence P., to General Electric Co. Escutcheon plate with push button for door bells. 226,550, 3–27–73, Cl. D8—181.
Mello, Thomas M.: *See*—
Munn, David E., Mello, and Maddestra. 226,572.
Monty Enterprises, Inc.: *See*—
Zakaski, Roman S. 226,562.
Morris, J. E. Luther. Putter. 226,568, 3–27–73, Cl. D34—5.
Munn, David E., T. M. Mello, and R. Maddestra, to Damon Corp. Vehicle toy. 226,572, 3–27–73, Cl. D34—15.
Nasta Industries, Inc.: *See*—
Spiegel, Norman. 226,571.
Neece, Roy M., to Tempo-Toy. Game board. 226,570, 3–27–73, Cl. D34—5.
Noack, William L., to Avery Products Corp. An adhesive label dispenser. 226,592, 3–27–73, Cl. D52—2.
North American Philips Corp.: *See*—
Rakocy, William J. 226,585.
O'Neil, Emmett L., and E. R. Anderson. Combined lamp shade and chain therefor. 226,578, 3–27–73, Cl. D48—16.
Owens-Illinois, Inc.: *See*—
Weckman, Richard L. 226,551.
Priefert, William D.: *See*—
Priefert, Marvin J., and W. D. 226,546.
Priefert, Marvin J., and W. D. End frame unit for a table and bench combination. 226,546, 3–27–73, Cl. D6—192.
Quality Oil Corp.: *See*—
Weber, Heinz. 226,555.
Rakocy, William J., to North American Philips Corp. Hot comb. 226,585, 3–27–73, Cl. D86—8.
Rid-O-Ray Inc.: *See*—
Iannini, Robert E. 226,582.
Rockwell Manufacturing Co.: *See*—
Jones, Lloyd K., and Downey. 226,561.
Rydeen, Robert L.: *See*—
Fernandez, Mario F., and Rydeen. 226,574.
Fernandez, Mario F., and Rydeen. 226,575.
Schaefer, Hermann R., to Sperry Rand Corp. Shaver. 226,590, 3–27–73, Cl. D95—3.
Schwarz, Charlotte L., to Wallace Silversmith, Inc. Pendant or the like. 226,577, 3–27–73, Cl. D45—17.
Shindler, Anthony. Pair of spectacles. 226,593, 3–27–73, Cl. D57—1.
Sloles, George W. Dodecahedron loudspeaker enclosure unit. 226,567, 3–27–73, Cl. D26—14.
Skyer, Robert A., G. E. Bowman, and D. A. Fulghum, to International Harvester Co. Tractor. 226,557, 3–27–73, Cl. D14—3.
Skyer, Robert A., G. E. Bowman, J. W. Zurek, R. A. Boehm, and J. P. Deschamps, to International Harvester Co. Tractor. 226,558, 3–27–73, Cl. D14—3.
Smythe, Wayne M. Carafe. 226,552, 3–27–73, Cl. D9—117.
Sperry Rand Corp.: *See*—
Schaefer, Hermann R. 226,590.
Spiegel, Norman, to Nasta Industries, Inc. Toy trackway. 226,571, 3–27–73, Cl. D34—15.
Squibb, E. R., & Sons, Inc.: *See*—
Bradsky, Louis. 226,554.
Stanley, Wallace A.: *See*—
Teasel, William A., and Stanley. 226,594.
Stanley Works, The: *See*—
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6 3,721,994
10 3,721,995
19 3,721,996
46 3,721,997
74 3,721,998
114 3,721,999
227 3,722,000
269 3,722,001

CLASS 3
1 3,722,002
3,722,003
3,722,004
1.1 3,722,005

CLASS 4
131 3,722,006
166 3,722,007
255 3,722,008

CLASS 5
8 3,722,205
67 3,722,010
93 3,722,009
118 3,722,011
247 3,722,013
348WB 3,722,012

CLASS 8
21C 3,723,055
26 3,723,056
116P 3,723,057
116.3 3,723,058

CLASS 9
8R 3,722,014
310B 3,722,015

CLASS 12
120.5 3,722,016

CLASS 13
1 3,723,630
9 3,723,631
32 3,723,632

CLASS 14
71 3,722,017

CLASS 15
1.5 3,722,018
114 3,722,019
167R 3,722,020
231 3,722,021
236R 3,722,022
257.1 3,722,023
339 3,722,024
340 3,722,025

CLASS 16
42 3,722,026
50 3,722,027
91 3,722,028
129 3,722,029
142 3,722,030
153 3,722,031

CLASS 17
1G 3,722,032
11 3,722,033
32 3,722,034
48 3,722,035

CLASS 19
282 3,722,036

CLASS 21
2.5 3,723,059
91 3,723,060
103 3,723,061

CLASS 23
230B 3,723,063
230R 3,723,062
3,723,064
253R 3,723,066
260 3,723,065
262 3,723,068
267C 3,723,069
277R 3,723,067
283 3,723,071
288F 3,723,070
288R 3,723,072
293 3,723,073

CLASS 24
73PF 3,722,037
81PE 3,722,038
201C 3,722,039
265B 3,722,040
283 3,722,041

CLASS 28
1.6 3,722,042

CLASS 29
25.11 3,722,043
25.16 3,722,044
25.17 3,722,045
25.19 3,722,046
34D 3,722,047
37R 3,722,048
38A 3,722,049
129.5 3,722,050
149.5NM 3,722,051
155R 3,722,052
163.5 3,722,053
182 3,723,076
182.7 3,723,077
194 3,723,078
200A 3,722,056
200D 3,722,055
3,722,057
3,722,058
200J 3,722,054
202D 3,722,059
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3,722,062
203D 3,722,060
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3,722,065
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557 3,722,078
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604 3,722,083
605 3,722,082
610 3,722,084
620 3,722,085
622 3,722,086
626 3,722,087
629 3,722,088

CLASS 30
4R 3,722,089
32 3,722,090
40 3,722,091
90.9 3,722,092
124 3,722,093

CLASS 32
2 3,722,094
3 3,722,096
5 3,722,098
17 3,722,097
22 3,722,095
32 3,722,099
40R 3,722,100
3,722,101

CLASS 33
126.7R 3,722,102
174D 3,722,103
3,722,104

CLASS 34
1 3,722,105
82 3,722,106

CLASS 35
17 3,722,108
28.5 3,722,109
30 3,722,110
48B 3,722,111

CLASS 36
2.5AL 3,722,112
11.5 3,722,113

CLASS 37
4 3,722,114

CLASS 38
21 3,722,115
27 3,722,116
77.83 3,722,117

CLASS 40
21R 3,722,118
132D 3,722,119
140 3,722,120
152 3,722,121
3,722,122
3,723,904

CLASS 42
16 3,722,123
54 3,722,124
89 3,722,125

CLASS 43
6.5 3,722,126
15 3,722,127
42.03 3,722,129
42.1 3,722,128
44.98 3,722,130

CLASS 44
1R 3,723,079

CLASS 46
1K 3,722,131
75 3,722,132
178 3,722,133
206 3,722,134
244A 3,722,135
247 3,722,136

CLASS 47
34.13 3,722,137
58 3,722,138
3,722,139

CLASS 49
30 3,722,140
139 3,722,141
248 3,722,142

CLASS 51
5 3,722,143
50R 3,722,144
56 3,722,145
73R 3,722,146
170T 3,722,147
225 3,722,148
241S 3,722,149
391 3,722,150

CLASS 52
36 3,722,151
79 3,722,152
81 3,722,153
121 3,722,154
122 3,722,163
133 3,722,155
169 3,722,156
211 3,722,157
224 3,722,158
252 3,722,159
278 3,722,160
400 3,722,161
608 3,722,162
684 3,722,164
704 3,722,165
720 3,722,166
726 3,722,167
742 3,722,168
745 3,722,169
3,722,170
3,722,171

CLASS 53
54 3,722,172
62 3,722,173
182 3,722,174
209 3,722,175
376 3,722,176
390 3,722,177

CLASS 55
4 3,722,178
40 3,722,179
46 3,722,180
67 3,722,181
124 3,722,182
128 3,722,183
174 3,722,184
238 3,722,185
304 3,722,186
323 3,722,187
384 3,722,188
389 3,722,189

CLASS 56
1 3,722,190
189 3,722,191
202 3,722,192
208 3,722,193
226 3,722,194
245 3,722,195
298 3,722,196
341 3,722,197

CLASS 57
58.89 3,722,198
77 3,722,199
130 3,722,200
144 3,722,201
3,722,202
160 3,722,203
164 3,722,204

CLASS 58
42.5 3,722,207
50R 3,722,206
90R 3,722,208

CLASS 60
6 3,722,209
16 3,722,210
36 3,722,211
39.08 3,722,212
39.16R 3,722,213
39.31 3,722,214
39.32 3,722,215
39.36 3,722,216
39.48 3,722,217
39.74A 3,722,219
39.74R 3,722,218
267 3,722,220
282 3,722,221

CLASS 61
38 3,722,222
46 3,722,223
72.1 3,722,225
72.4 3,722,224

CLASS 62
13 3,722,226
200 3,722,230
206 3,722,228
347 3,722,227
354 3,722,229

CLASS 65
30 3,723,080
55 3,723,081
84 3,723,082
119 3,723,083
136 3,723,084
182A 3,723,085

CLASS 66
132 3,722,231

CLASS 68
3SS 3,722,232
5D 3,722,233
23.5 3,722,234
183 3,722,235

CLASS 70
78 3,722,236
107 3,722,237
212 3,722,239
278 3,722,238
364A 3,722,240
3,722,242
364R 3,722,241
369 3,722,243

CLASS 71
29 3,723,086
92 3,723,087
93 3,723,088
94 3,723,089
115 3,723,090
122 3,723,091

CLASS 72
16 3,722,244
60 3,722,245
97 3,722,246
106 3,722,247
176 3,722,248
187 3,722,249
224 3,722,250
294 3,722,251
3,722,280
306 3,722,252
338 3,722,253
383 3,722,254
447 3,722,255
470 3,722,256
475 3,722,257

CLASS 73
6 3,722,258
19 3,722,259
37.7 3,722,260
40.5R 3,722,261
59 3,722,262
67.8S 3,722,263
88.5R 3,722,264
117.3 3,722,265
132 3,722,266
133R 3,722,267
143 3,722,268
146 3,722,269
3,722,270
170A 3,722,271
178R 3,722,272
194EM 3,722,274
194B 3,722,273
3,722,275
194E 3,722,276
228 3,722,278
231M 3,722,279
304R 3,722,281
355R 3,722,282
362SC 3,722,283
382 3,722,284
3,722,285
3,722,286
3,722,287
3,722,288
3,722,289
3,722,290
422R 3,722,291
454 3,722,292
517R 3,722,293

CLASS 74
3.52 3,722,294
5 3,722,295
3,722,296
5.6 3,722,297
10.33 3,722,299
10.8 3,722,298
15.63 3,722,300
3,722,301
61 3,722,302
96 3,722,303
112 3,722,304
125.5 3,722,305
219 3,722,306
3,722,307
220 3,722,277
230.17M 3,722,308
230.8 3,722,309
3,722,310
425 3,722,311
459 3,722,312
483PB 3,722,313
512 3,722,314
520 3,722,315
524 3,722,316
527 3,722,317
535 3,722,318
544 3,722,319
560 3,722,320
606R 3,722,321
675 3,722,322
681 3,722,323
687 3,722,324
751 3,722,325
752B 3,722,326

CLASS 75
.5R 3,723,092
10R 3,723,093
10V 3,723,097
12 3,723,094
3,723,098
21 3,723,095
3,723,096
60 3,723,099
123CB 3,723,100
126R 3,723,101
128R 3,723,102
129 3,723,103
134F 3,723,104
134H 3,723,105
170 3,723,106
171 3,723,107
3,723,108
214 3,723,109

CLASS 81
3.1R 3,722,327
9.22 3,722,328
10 3,722,329
15.8 3,722,330
52.4 3,722,331
57.38 3,722,332

CLASS 82
29 3,722,333
34A 3,722,334

CLASS 83
4 3,722,339
57 3,722,335
63 3,722,336
137 3,722,337
203 3,722,340
278 3,722,338
413 3,722,341
418 3,722,342
422 3,722,343

CLASS 84
1.01 3,723,633
1.24 3,722,344
291 3,722,345
318 3,722,346
342 3,722,347
380 3,722,348
422R 3,722,349
422S 3,722,350
423 3,722,351
454 3,722,352
3,722,353

CLASS 86
1 3,722,354

CLASS 89
11 3,722,356
36A 3,722,355
36H 3,722,357
147 3,722,358

CLASS 90
7 3,722,359
11C 3,722,360
11D 3,722,363
17 3,722,361
24B 3,722,362

CLASS 91
3 3,722,364
4A 3,722,365
170R 3,722,366
367 3,722,367
375R 3,722,368
380 3,722,369
504 3,722,372
506 3,722,370

CLASS 92
5R 3,722,371
97 3,722,373
128 3,722,374
168 3,722,375

CLASS 93
8R 3,722,376
35H 3,722,377

CLASS 95
10C 3,722,382
13 3,722,383
14 3,722,384
22 3,722,385
31AC 3,722,388
31DS 3,722,386
31R 3,722,387
39 3,722,389
45 3,722,390
53EB 3,722,391
62 3,722,392

86 3,722,393
95 3,722,394

CLASS 96

1PC 3,723,110
1C 3,723,111
1.2 3,723,112
3,723,113
1.4 3,723,114
1.6 3,723,116
1.8 3,723,115
27 3,723,121
29 3,723,117
3,723,118
33 3,723,119
35.1 3,723,120
48R 3,723,122
48 3,723,123
3,723,124
56.2 3,723,125
61M 3,723,126
74 3,723,127
84R 3,723,128

CLASS 98

33R 3,722,396
33 3,722,395
115R 3,722,397

CLASS 99

2F 3,723,130
2 3,723,129
83 3,723,131
92 3,723,132
105 3,723,133
134 3,723,134
140R 3,723,135
158 3,723,136
166 3,723,137
323.8 3,722,399
353 3,722,400
407 3,722,401
467 3,722,402

CLASS 100

49 3,722,403
52 3,722,404

CLASS 101

45 3,722,405
469 3,722,406

CLASS 102

16 3,722,407
3,722,408
18 3,722,409
23 3,722,410
43P 3,722,411
3,722,412
49.2 3,722,413
67 3,722,414
70.2P 3,722,417
70.2R 3,722,415
3,722,416
3,722,418
78 3,722,419
95 3,722,420
101 3,722,421

CLASS 104

17A 3,722,422
17R 3,722,423
23FS 3,722,424
88 3,722,425
3,722,426
155 3,722,427

CLASS 105

365 3,722,428
369BA 3,722,429

CLASS 106

1 3,723,138
39.6 3,723,140
47R 3,723,141
52 3,723,142
53 3,723,143
54 3,723,144
90 3,723,145
110 3,723,146
176 3,723,147
287PR 3,723,148
300 3,723,149
307 3,723,150
308Q 3,723,151
310 3,723,152

CLASS 108

58 3,722,430
153 3,722,431

CLASS 109

17 3,722,432

CLASS 110

8R 3,722,433

CLASS 112

79A 3,722,434
121.11 3,722,435
3,722,436
121.12 3,722,437
199 3,722,438
205 3,722,441
254 3,722,439
262 3,722,440
410 3,722,442

CLASS 113

54 3,722,443

CLASS 114

16G 3,722,445
16R 3,722,444
23 3,722,446
3,722,447
55 3,722,448
75 3,722,449
102 3,722,451
235B 3,722,452
665H 3,722,450

CLASS 115

34R 3,722,454
41HT 3,722,455
41R 3,722,456

CLASS 116

114 3,722,457
129R 3,722,459
129 3,722,458
132 3,722,460
133 3,722,461

CLASS 117

12.2P 3,723,170
21 3,723,153
33.3 3,723,154
36.2 3,723,156
46CB 3,723,157
47A 3,723,158
3,723,159
50 3,723,160
54 3,723,155
66 3,723,161
71M 3,723,162
72 3,723,163
76P 3,723,164
93.1PF 3,723,165
93.31 3,723,166
3,723,167
94 3,723,168
111H 3,723,169
122PF 3,723,171
138.8A 3,723,172
139.5CQ 3,723,173
155UA 3,723,174
201 3,723,175
212 3,723,176
217 3,723,177
227 3,723,178

CLASS 118

5 3,722,462
6 3,722,463
48 3,722,464
123 3,722,465
212 3,722,466
246 3,722,453
301 3,722,467
315 3,722,468
414 3,722,469
637 3,722,471

CLASS 119

1 3,722,472
28 3,722,473
3,722,474
51.11 3,722,475
61 3,722,476
82 3,722,477
120 3,722,478

CLASS 122

34 3,722,479

CLASS 123

8.01 3,722,480
8.07 3,722,493
46R 3,722,481
66 3,722,482
90.14 3,722,483
90.27 3,722,484
102 3,722,485
117A 3,722,486
140MP 3,722,487
148E 3,722,489
149D 3,722,488
179L 3,722,490
198D 3,722,491
198R 3,722,492

CLASS 124

7 3,722,494
9 3,722,495

CLASS 125

13 3,722,496
14 3,722,497

CLASS 126

38 3,722,498
292 3,722,499

CLASS 127

63 3,723,179

CLASS 128

1C 3,722,501
1R 3,722,500
2F 3,722,502
3,722,503
2.05F 3,722,505
2.08 3,722,506
2.1R 3,722,504
68 3,722,507
133 3,722,508
140N 3,722,509
142 3,722,510
147 3,722,511
220 3,722,512
334R 3,722,599
465 3,722,513
533 3,722,514

CLASS 131

15B 3,722,515
17R 3,722,516

CLASS 132

5 3,722,517
75.6 3,722,518
88.7 3,722,519

CLASS 134

25 3,723,180

CLASS 136

10 3,723,181
26 3,723,182
83R 3,723,183
133 3,723,184
153 3,723,185
3,723,186
161 3,723,187
162 3,723,188
205 3,723,189

CLASS 137

1 3,722,520
94 3,722,523
101 3,722,524
106 3,722,525
107 3,722,526
155 3,722,527
255 3,722,528
266 3,722,529
268 3,722,530
271 3,722,531
357 3,722,532
382 3,722,533
488 3,722,534
493.4 3,722,535
505.46 3,722,536
559 3,722,537
588 3,722,538
590 3,722,539
596 3,722,540
3,722,541
596.1 3,722,542
596.12 3,722,543
608 3,722,544
625.21 3,722,546
625.3 3,722,545
625.63 3,722,547
812 3,722,522
818 3,722,521

CLASS 138

30 3,722,548
89 3,722,549
137 3,722,550

CLASS 139

127P 3,722,551
144 3,722,552

CLASS 140

93A 3,722,553
115 3,722,554
123 3,722,555

CLASS 141

2 3,722,556
59 3,722,557
65 3,722,558
98 3,722,559
172 3,722,560
316 3,722,561

CLASS 144

309 3,722,562
317 3,722,563

CLASS 148

1.5 3,723,190
6.17 3,723,192
12 3,723,194
12.3 3,723,193
12.4 3,723,195
23 3,723,191
31 3,723,196
103 3,723,197
131 3,723,198
175 3,723,199
3,723,200
3,723,201

CLASS 149

19 3,723,202
3,723,203
3,723,204
3,723,205
3,723,206
92 3,723,207
94 3,723,208

CLASS 150

39 3,722,564

CLASS 151

41.73 3,722,565

CLASS 152

169 3,722,566
354 3,722,567
374 3,722,568
429 3,722,569

CLASS 156

6 3,723,209
11 3,723,210
50 3,723,247
63 3,723,211
69 3,723,212
72 3,723,213
87 3,723,214
92 3,723,215
110 3,723,216
164 3,723,217
167 3,723,218
218 3,723,219
219 3,723,220
229 3,723,221
309 3,723,222
313 3,723,223
500 3,723,224
554 3,723,225
556 3,723,226
557 3,723,227
568 3,723,228
580 3,723,229
3,723,230

CLASS 157

1.28 3,722,570

CLASS 160

68 3,722,571
107 3,722,572
326 3,722,573

CLASS 161

53 3,723,231
68 3,723,232
3,723,233
89 3,723,234
140 3,723,235
151 3,723,236
168 3,723,237
169 3,723,238
170 3,723,239
173 3,723,240
227 3,723,241

CLASS 162

38 3,723,242
52 3,723,243
151 3,723,244
284 3,723,245

CLASS 164

41 3,722,574
70 3,722,575
282 3,722,576
366 3,722,577

CLASS 165

1 3,722,578
47 3,722,579
50 3,722,580
96 3,722,581
143 3,722,582
156 3,722,583

CLASS 166

.5 3,722,584
.6 3,722,585
85 3,722,586
88 3,722,587
123 3,722,588
250 3,722,589
273 3,722,590
295 3,722,591
304 3,722,592
305D 3,722,593
305R 3,722,594
308 3,722,595

CLASS 169

1A 3,722,596
38 3,722,597

CLASS 172

10 3,722,598

CLASS 173

1 3,722,600
28 3,722,601
32 3,722,602
159 3,722,603

CLASS 174

15C 3,723,634
68.5 3,723,635
70R 3,723,636

CLASS 175

19 3,722,604
40 3,722,605
41 3,722,606
57 3,722,607
65 3,722,608
92 3,722,609
386 3,722,610

CLASS 176

1 3,723,246
3,723,703

CLASS 177

144 3,722,611

CLASS 178

5.2R 3,723,637
5.4CD 3,723,638
5.4ST 3,723,639
6 3,723,640
3,723,641
3,723,642
6.6A 3,723,643
3,723,645
6.6P 3,723,644
6.6R 3,723,646
6.7R 3,723,647
6.8 3,723,648
7.1 3,723,649
7.2 3,723,650
7.5D 3,723,651

CLASS 179

1VS 3,723,652
2DP 3,723,655
2TV 3,723,653
3,723,654
2A 3,723,656
15BW 3,723,657
15R 3,723,658
18FG 3,723,661
18GE 3,723,660
18HA 3,723,659
18HB 3,723,662
84R 3,723,663
90CS 3,723,664
100.1VC 3,723,667
100.2C 3,723,665
3,723,669
100.2D 3,723,668
100.2S 3,723,666
156 3,723,670
189R 3,723,671

CLASS 180

32 3,722,612
52 3,722,613
105E 3,722,614
112 3,722,615

CLASS 181

31B 3,722,616
32R 3,722,617
33G 3,722,618
3,722,619
57 3,722,620

CLASS 182

118 3,722,621
159 3,722,622

CLASS 184

6.11 3,722,624
6.3 3,722,623
55A 3,722,625
106 3,722,626

CLASS 187

8.41 3,722,627
29R 3,722,628

CLASS 188

1A 3,722,629
4R 3,722,630
3,722,631
42 3,722,632
68 3,722,633
73.5 3,722,634
79.5P 3,722,635
170 3,722,636
196P 3,722,637
280 3,722,638
315 3,722,639
316 3,722,640
505 3,722,470

CLASS 191

50 3,723,672

CLASS 192

8C 3,722,641
8R 3,722,642
13R 3,722,643
56R 3,722,644
70.13 3,722,645
109F 3,722,646
113B 3,722,647

CLASS 193

1 3,722,648

CLASS 194

9 3,722,649
10 3,722,650
64 3,722,652
102 3,722,653

CLASS 195

28R 3,723,248
47 3,723,249
62 3,723,250
66B 3,723,251
3,723,252
66R 3,723,253
80 3,723,254
109 3,723,255

CLASS 197

16 3,722,651
82 3,722,654
133 3,722,655

CLASS 198

19 3,722,656
33AA 3,722,658
33AB 3,722,657
33AC 3,722,659
39 3,722,660
76 3,722,661
82 3,722,662
160 3,722,663
168 3,722,664
184 3,722,665
213 3,722,666
219 3,722,865
230 3,722,667

CLASS 200

1R 3,723,673
11TW 3,723,674
38R 3,723,675
39R 3,723,676
42A 3,723,678
44 3,723,677
50B 3,723,679
61.45R 3,723,680
61.53 3,723,681
61.64 3,723,682
78 3,723,683
83R 3,723,684
148E 3,723,685
153SC 3,723,686
157 3,723,687
166BC 3,723,689
166C 3,723,688
168H 3,723,692
168R 3,723,691

CLASS 203

43 3,723,256

CLASS 204

15 3,723,257
3,723,258
3,723,259
49 3,723,260
51 3,723,261
55R 3,723,262
3,723,263
80 3,723,264
83 3,723,265
98 3,723,266
105R 3,723,267
129.1 3,723,268
129.65 3,723,269
159.22 3,723,270
162R 3,723,271
163R 3,723,272
180P 3,723,273
181 3,723,274
3,723,275
192 3,723,276
3,723,277
3,723,278
195L 3,723,281
195P 3,723,280
195S 3,723,279
197 3,723,282
206 3,723,283
213 3,723,284
228 3,723,285
243R 3,723,286
3,723,287
300 3,723,288
312 3,723,289
328 3,723,290

CLASS 206

46FR 3,722,668
56AC 3,722,670
56K 3,722,669
65K 3,722,671
79 3,722,672

CLASS 208

46 3,723,291
85 3,723,292
3,723,293
86 3,723,294
87 3,723,295
89 3,723,296
95 3,723,297
143 3,723,298
3,723,299
146 3,723,300
213 3,723,301
310 3,723,302
325 3,723,303

CLASS 209

73 3,722,673
3,722,674

74 3,722,676
80.5 3,722,675
144 3,722,677
156 3,722,678
164 3,722,679

CLASS 210

11 3,723,304
22 3,723,305
3,723,306
33 3,723,307
38 3,723,308
44 3,723,309
53 3,723,310
96 3,722,680
108 3,722,681
123 3,722,682
132 3,722,683
167 3,722,684
169 3,722,685
170 3,722,686
219 3,722,687
242 3,722,688
3,722,689
3,722,690
304 3,722,691
314 3,722,692
320 3,722,693
321 3,722,694
3,722,695
435 3,722,696
451 3,722,697
525 3,722,698

CLASS 211

153 3,722,700
169 3,722,699
177 3,722,701
178R 3,722,702
3,722,703
183 3,722,704

CLASS 212

15 3,722,705
44 3,722,706
59R 3,722,707

CLASS 213

151 3,722,708

CLASS 214

1BA 3,722,710
1BB 3,722,712
1BC 3,722,709
1BD 3,722,711
8.5A 3,722,713
10.5R 3,722,714
17D 3,722,715
38B 3,722,716
83.22 3,722,717
100 3,722,718
310 3,722,719
317 3,722,720
515 3,722,721
522 3,722,722
674 3,722,723
776 3,722,724

CLASS 215

1C 3,722,725
3,722,726
9 3,722,727
11B 3,722,728
41 3,722,729

CLASS 219

62 3,723,693
69E 3,723,695
69M 3,723,690
69V 3,723,694
73 3,723,696
78 3,723,699
85 3,723,697
98 3,723,698
3,723,700
100 3,723,701
124 3,723,702
242 3,723,704
243 3,723,705
274 3,723,706
276 3,723,707
385 3,723,708
388 3,723,709

CLASS 220

46R 3,722,730
60 3,722,731
66 3,722,732
82R 3,722,733
89A 3,722,734
97B 3,722,736
97E 3,722,735
113 3,722,737
3,722,738

CLASS 221

3 3,722,739
7 3,722,740
11 3,722,741
15 3,722,742
77 3,722,743
129 3,722,744
130 3,722,745
205 3,722,746

CLASS 222

48 3,722,748
56 3,722,747
61 3,722,749
94 3,722,750
3,722,751
132 3,723,851
145 3,722,752
146HA 3,722,753
183 3,722,754
193 3,722,755
212 3,722,756
385 3,722,757
3,722,758
396 3,722,759
402.22 3,722,760
409 3,722,761
568 3,722,762

CLASS 223

26 3,722,789
101 3,722,763

CLASS 224

5R 3,722,764
42.1E 3,722,765
42.1F 3,722,766

CLASS 225

49 3,722,767
105 3,722,768

CLASS 226

25 3,722,769
3,722,773
45 3,722,770
51 3,722,771
62 3,722,774
100 3,722,775
195 3,722,776
196 3,722,772

CLASS 228

4 3,722,777
13 3,722,778

CLASS 229

1.5C 3,722,779
17G 3,722,780
28 3,722,781
39R 3,722,782
40 3,722,783
43 3,722,784
54R 3,722,785
3,722,786
92.3 3,722,787

CLASS 231

2E 3,722,788

CLASS 233

26 3,722,790
3,722,791

CLASS 234

38 3,722,792

CLASS 235

50A 3,722,793
60TK 3,722,794
61.11E 3,723,710
62F 3,722,795
70B 3,722,796
92EA 3,723,711
151.31 3,723,712
151.35 3,723,713
152 3,723,714
175 3,723,715
176 3,723,716
181 3,723,717
185 3,723,718
190 3,723,719

CLASS 236

1C 3,722,813
14 3,722,811
15A 3,722,812

CLASS 239

1 3,722,814
2R 3,722,815
17 3,722,816
77 3,722,817
85 3,722,818
102 3,722,819
129 3,722,820
133 3,722,821
265.17 3,722,797
428.5 3,722,798
443 3,722,799
447 3,722,800
533 3,722,801
658 3,722,802

CLASS 240

2R 3,723,720
7.1A 3,723,721
7.7 3,723,722
10T 3,723,723
11.2E 3,723,724

CLASS 241

46.02 3,722,803
46.11 3,722,804
73 3,722,805
291 3,722,806

CLASS 242

18R 3,722,807
46.4 3,722,808
55.19R 3,722,809
56R 3,722,810
67.4 3,722,822
86 3,722,823
107.4 3,722,824
129 3,722,825
129.5 3,722,826
158.4R 3,722,827
181 3,722,828
199 3,722,829

CLASS 244

1SS 3,722,840
17.23 3,722,830

CLASS 245

46.59 3,723,725

CLASS 246

468 3,723,728

CLASS 248

43 3,722,841
124 3,722,842
300 3,722,843
302 3,722,844
346 3,722,845
357 3,722,846
407 3,722,847

CLASS 249

197 3,722,848
219R 3,722,849

CLASS 250

41.9SB 3,723,729
41.9C 3,723,730
43.5MR 3,723,732
43.5R 3,723,731
49.5T 3,723,733
71.5R 3,723,734
3,723,735
3,723,736
83.1 3,723,726
83.3H 3,723,737
3,723,738
3,723,739
83.6R 3,723,740
84 3,723,741
106 3,723,742
108R 3,723,743
203R 3,723,744
203 3,723,745
218R 3,723,746
218 3,723,747
233 3,723,748

CLASS 251

52 3,722,850
54 3,722,851
61.2 3,722,852
110 3,722,853
127 3,722,854
151 3,722,855
152 3,722,856
203 3,722,857
209 3,722,858
315 3,722,859
332 3,722,860

CLASS 252

8.5A 3,723,311
11 3,723,312
33.3 3,723,313
33.4 3,723,314
49.8 3,723,315
50 3,723,316
51.5R 3,723,317
67 3,723,318
78 3,723,319
88 3,723,320
3,723,321
89 3,723,322
90 3,723,323
3,723,324
106 3,723,325
107 3,723,326
110 3,723,327
111 3,723,328
121 3,723,329
153 3,723,330
165 3,723,331
171 3,723,332
175 3,723,333
181 3,723,334
182 3,723,335
186 3,723,336
301.1W 3,723,338
301.4F 3,723,337
301.6R 3,723,339
307 3,723,340
312 3,723,341
358 3,723,342
361 3,723,343
373 3,723,344
3,723,345
389A 3,723,347
408 3,723,346
3,723,349
429B 3,723,348
429C 3,723,350
454 3,723,351
3,723,352
459 3,723,353
478 3,723,354
511 3,723,355
513 3,723,359
526 3,723,356
542 3,723,360
545 3,723,357
546 3,723,358

CLASS 254

10.5 3,722,862
64 3,722,861
105 3,722,863
124 3,722,864

CLASS 259

6 3,722,831
44 3,722,832
72 3,722,833
105 3,722,834
178R 3,722,835

CLASS 260

2EP 3,723,361
2.5AB 3,723,367
2.5AC 3,723,364
2.5AS 3,723,365
2.5AW 3,723,363
2.5BF 3,723,366
2.5B 3,723,362
17.2 3,723,368
22CB 3,723,369
22TN 3,723,370
28.5AV 3,723,371
29.1R 3,723,372
29.4UA 3,723,374
29.4R 3,723,377
29.6HN 3,723,376
29.6TA 3,723,375
29.6F 3,723,373
30.8DM 3,723,378
31.8M 3,723,379
32.6NT 3,723,380
33.8UA 3,723,381
37SB 3,723,481
38 3,723,382
41B 3,723,383
45.75N 3,723,384
45.75R 3,723,139
46.5UA 3,723,497
46.5E 3,723,385
47UP 3,723,387
47C 3,723,388
47R 3,723,386
49 3,723,389
75NP 3,723,392
75M 3,723,390
3,723,391
77.5AA 3,723,394
77.5B 3,723,393
78R 3,723,396
78.5CL 3,723,395
80.72 3,723,398
80.73 3,723,399
80.8 3,723,397
82.1 3,723,400
83.3 3,723,727
91.3VA 3,723,401
93.7 3,723,402
94.9GB 3,723,404
3,723,405
94.9B 3,723,403
112.5 3,723,406
123.5 3,723,407
209R 3,723,408
3,723,409
210AB 3,723,411
210R 3,723,410
3,723,412
232 3,723,413
239BD 3,723,414
239BF 3,723,416
239A 3,723,415
239R 3,723,417
239.55R 3,723,418
240TC 3,723,420
240B 3,723,425
240E 3,723,422
240F 3,723,421
240R 3,723,423
240.6 3,723,419
3,723,424
244R 3,723,426
248CS 3,723,428
248NS 3,723,427
249.7A 3,723,430
249.9 3,723,429
250R 3,723,431
251QB 3,723,432
256.4C 3,723,433
268C 3,723,434
270R 3,723,435
281 3,723,436
283CN 3,723,439
285 3,723,437
293.54 3,723,440
293.57 3,723,441
293.66 3,723,442
293.68 3,723,443
295AM 3,723,444
3,723,445
295.5R 3,723,446
304 3,723,447
3,723,449
306.8D 3,723,448
306.8R 3,723,450
307F 3,723,451
3,723,452
309 3,723,453
309.6 3,723,455
309.7 3,723,454
310R 3,723,456
325 3,723,457
3,723,458
3,723,459
326.15 3,723,461
3,723,464
326.5F 3,723,460
327B 3,723,463
327E 3,723,462
328 3,723,465
333 3,723,466
340.5 3,723,467
340.7 3,723,468
343.3 3,723,469
343.5 3,723,470
345.2 3,723,471
346.2R 3,723,472
346.6 3,723,473
347.2 3,723,474
3,723,475
347.7 3,723,476
347.8 3,723,477
348C 3,723,478
368 3,723,479
373 3,723,480
397.4 3,723,482
397.45 3,723,483
3,723,484
408 3,723,485
410.9R 3,723,486
412.4 3,723,487
429.7 3,723,488
3,723,489
438.1 3,723,490
448.2B 3,723,491
448.8R 3,723,492
455A 3,723,493
3,723,494
462A 3,723,495
465E 3,723,496
465.4 3,723,498
3,723,499
465.8R 3,723,500
465.9 3,723,501
471C 3,723,502
473S 3,723,503
479R 3,723,504
482C 3,723,505
484R 3,723,506
486H 3,723,507
488B 3,723,508
488R 3,723,509
497R 3,723,510
501.14 3,723,511
501.15 3,723,512
513.7 3,723,513
519 3,723,514
523A 3,723,515
524R 3,723,516
3,723,517
3,723,518
526S 3,723,519
543P 3,723,520
3,723,521
552R 3,723,522
558D 3,723,523
559S 3,723,524
563R 3,723,525
3,723,526
564R 3,723,527
566A 3,723,528
583N 3,723,529
584R 3,723,530
586B 3,723,532
586R 3,723,531
590 3,723,533
3,723,534
593R 3,723,535
606.5P 3,723,536
3,723,537
609F 3,723,538
615BF 3,723,539
619A 3,723,540
621H 3,723,541
631.5 3,723,542
633 3,723,543
3,723,544
635Y 3,723,545
644 3,723,546
645 3,723,547
651HA 3,723,548
653.3 3,723,549
656R 3,723,550
666A 3,723,551
666B 3,723,553
668A 3,723,552
3,723,554
3,723,556
668D 3,723,557
668F 3,723,555
674A 3,723,558
676R 3,723,559
677AD 3,723,561
677H 3,723,560
683D 3,723,562
3,723,563
683.2 3,723,564
683.43 3,723,565
824R 3,723,566
825 3,723,567
835 3,723,568
3,723,569
836 3,723,570
3,723,571
860 3,723,572
866 3,723,573
873 3,723,574
879 3,723,575
899 3,723,576
900 3,723,577
949 3,723,578
954 3,723,579
974 3,723,580

CLASS 261

1 3,722,836
34A 3,722,837
72R 3,722,838
111 3,722,839

CLASS 264

.5 3,723,581
37 3,723,582
40 3,723,583
45 3,723,584
3,723,585
53 3,723,586
61 3,723,587
83 3,723,588
101 3,723,589
104 3,723,590
237 3,723,591
289 3,723,438
290R 3,723,592
332 3,723,593

CLASS 266

1S 3,722,868
20 3,722,869
3,722,870
29 3,722,871
34L 3,722,873
34R 3,722,872

CLASS 267

64R 3,722,874
122 3,722,875
140 3,722,876

CLASS 270

57 3,722,877

CLASS 271

31 3,722,878
47 3,722,879
51 3,722,880

CLASS 272

60 3,722,881
73 3,722,882
85 3,722,883

CLASS 273

1E 3,722,884
1R 3,722,885
1.5R 3,722,886
77A 3,722,887
126R 3,722,888
176F 3,722,889
186A 3,722,890

CLASS 274

4F 3,722,892
22 3,722,891
23R 3,722,893

CLASS 277

9 3,722,894
34.3 3,722,895
87 3,722,896
154 3,722,897
206 3,722,898
237 3,722,899

CLASS 280

7.13 3,722,900
11.13L 3,722,901
11.35T 3,722,902
11.37F 3,722,903

36R 3,722,904
39 3,722,905
47.4 3,722,906
95A 3,722,907
124B 3,722,908
150SB 3,722,909
179R 3,722,910
3,722,911
287 3,722,912
3,722,913
407 3,722,914
415A 3,722,915
421 3,722,916
423R 3,722,917
432 3,722,918
3,722,919
446B 3,722,920
473 3,722,921

CLASS 282

29B 3,722,922

CLASS 285

55 3,722,923
3,722,924
3,722,925
261 3,722,926
317 3,722,927

CLASS 287

20.924 3,722,928
53SS 3,722,929
54E 3,722,930
93 3,722,931
103D 3,722,932
189.36A 3,722,933

CLASS 289

13 3,722,934

CLASS 292

63 3,722,935
64 3,722,936
79 3,722,937
92 3,722,938

CLASS 293

88 3,722,939

CLASS 294

1R 3,722,940
66R 3,722,941
74 3,722,942
82R 3,722,943
83 3,722,944
87.2 3,722,945

CLASS 296

23MC 3,722,946
26 3,722,947
35A 3,722,948
97C 3,722,949

CLASS 297

218 3,722,950
390 3,722,951
440 3,722,952
445 3,722,953
452 3,722,954
453 3,722,955

CLASS 298

2 3,722,956

CLASS 299

86 3,722,957

CLASS 301

37N 3,722,958
105B 3,722,959

CLASS 303

21AF 3,722,960

CLASS 305

25 3,722,961
35EB 3,722,962
38 3,722,963

CLASS 307

10BP 3,723,752
10R 3,723,751
38 3,723,749
41 3,723,753
64 3,723,750
88ET 3,723,754
88.3 3,723,755
106 3,723,756
114 3,723,757
117 3,723,758
203 3,723,759
3,723,760
208 3,723,761
228 3,723,762
229 3,723,763
233 3,723,764
3,723,765
235A 3,723,766
238 3,723,767
252UA 3,723,769
252L 3,723,768
256 3,723,770
261 3,723,771
293 3,723,772
295 3,723,773
296 3,723,774
304 3,723,775
318 3,723,776

CLASS 308

3.8 3,722,964
122 3,722,965
187 3,722,967
187.1 3,722,966
191 3,722,968
193 3,722,969

CLASS 310

5 3,723,777
8.9 3,723,778
13 3,723,779
3,723,780
51 3,723,781
68D 3,723,794
93 3,723,795
126 3,723,796
196 3,723,797

CLASS 312

107 3,722,971
305 3,722,972
325 3,722,973
330 3,722,974
348 3,722,975

CLASS 313

30 3,723,782
32 3,723,783
47 3,723,784
63 3,723,785
70R 3,723,786
92PH 3,723,787
93 3,723,788
108R 3,723,789
221 3,723,790
237 3,723,791
318 3,723,792
355 3,723,793

CLASS 315

3.5 3,723,798
11 3,723,799
12 3,723,800
13C 3,723,801
18 3,723,802
22 3,723,803
27GD 3,723,804
3,723,805
39.51 3,723,806
83 3,723,807
95 3,723,808
211 3,723,809
241P 3,723,810

CLASS 316

3 3,722,976

CLASS 317

2R 3,723,811
14A 3,723,812
16 3,723,820
18B 3,723,813
18D 3,723,814
3,723,815
20 3,723,816
31 3,723,817
36TD 3,723,818
61 3,723,819
69 3,723,821
71 3,722,970
101DH 3,723,822
3,723,823
120 3,723,824
123 3,723,825
135R 3,723,826
137 3,723,827
141R 3,723,828
141S 3,723,829
234R 3,723,830
3,723,831
3,723,832
3,723,833
3,723,834
3,723,835
3,723,836
235R 3,723,837
258 3,723,838

CLASS 318

15 3,723,839
432 3,723,840
574 3,723,841
602 3,723,842
612 3,723,843

CLASS 320

59 3,723,844

CLASS 321

1.5 3,723,845
15 3,723,846
18 3,723,849
27R 3,723,847
45R 3,723,848
47 3,723,850

CLASS 323

8 3,723,852
20 3,723,853
3,723,854
21 3,723,855

CLASS 324

.5G 3,723,856
20CR 3,723,857
28RS 3,723,858
34R 3,723,859
37 3,723,860
40 3,723,861
41 3,723,862
51 3,723,863
52 3,723,864
61R 3,723,865
3,723,866
73AT 3,723,868
73PC 3,723,867
77B 3,723,869
82 3,723,870
99R 3,723,871
141 3,723,872
158T 3,723,873
3,723,874

CLASS 325

13 3,723,875
30 3,723,877
32 3,723,878
38A 3,723,880
38R 3,723,879
64 3,723,876
115 3,723,881
357 3,723,882
476 3,723,883
477 3,723,884

CLASS 328

5 3,723,885
58 3,723,886
76 3,723,887
134 3,723,888
3,723,889

CLASS 329

50 3,723,890
103 3,723,891

CLASS 330

4.9 3,723,893
29 3,723,894
3,723,895
3,723,897
30R 3,723,896
35 3,723,892

CLASS 331

4 3,723,898
49 3,723,899
55 3,723,900
65 3,723,901
94.5G 3,723,902
94.5M 3,723,903
109 3,723,905
117D 3,723,906
143 3,723,907
177R 3,723,908

CLASS 332

11D 3,723,909
31T 3,723,910

CLASS 333

11 3,723,913
3,723,914
18 3,723,911
20 3,723,912
30R 3,723,915
30 3,723,916
32 3,723,917
72 3,723,918
3,723,919
3,723,920
95R 3,723,921

CLASS 335

68 3,723,922
71 3,722,998
81 3,723,923
169 3,723,924
187 3,723,925
268 3,723,926
285 3,723,927
3,723,928

CLASS 337

38 3,723,929
158 3,723,930
342 3,723,931
405 3,723,932

CLASS 338

2 3,723,933
15 3,723,934
28 3,723,935
40 3,723,936
143 3,723,937
162 3,723,938

CLASS 339

14R 3,723,939
3,723,941
3,723,942
17CF 3,723,943
45R 3,723,944
54 3,723,945
64M 3,723,940
89R 3,723,946
91R 3,723,947
99R 3,723,948
177R 3,723,949
198R 3,723,950

CLASS 340

3R 3,723,951
3,723,952
3,723,953
3,723,954
5MP 3,723,958
5R 3,723,955
3,723,956
3,723,957
6R 3,723,959
3,723,960
16R 3,723,962
27 3,723,963
52F 3,723,964
53 3,723,965
58 3,723,966
63 3,723,967
69 3,723,968
146.3MA 3,723,970
146.3Z 3,723,969
163R 3,723,971
172.5 3,723,972
3,723,973
3,723,974
3,723,975
3,723,976
173AM 3,723,979
173CR 3,723,978
173PL 3,723,977
174MC 3,723,983
174RC 3,723,984
174TF 3,723,985
174.1B 3,723,980
174.1C 3,723,981
174.1G 3,723,982
177R 3,723,986
242 3,723,987
258R 3,723,988
259 3,723,989
3,723,990
3,723,991
347DD 3,722,107
380 3,723,961

CLASS 350

1 3,722,977
3,722,978
54 3,722,979
96WG 3,722,981
135 3,722,983
147 3,722,982
280 3,722,984
311 3,722,985

CLASS 351

176 3,722,986

CLASS 352

17 3,722,987
125 3,722,988
137 3,722,989
231 3,722,990

CLASS 353

27 3,722,991

CLASS 355

3 3,722,992
3,722,993
10 3,722,994
13 3,722,995
45 3,722,999
53 3,722,996
64 3,722,997
83 3,722,980
3,723,000
84 3,723,001

CLASS 356

4 3,723,003
5 3,723,002
28 3,723,004
29 3,723,005
30 3,723,006
75 3,723,007
88 3,723,008
107 3,723,009
124 3,723,010
152 3,723,011
3,723,012
3,723,013
226 3,723,014

CLASS 401

278 3,723,015

CLASS 404

31 3,722,378
68 3,722,379
117 3,722,380
3,722,381

CLASS 408

3 3,723,016
16 3,723,017

CLASS 415

30 3,723,018
53 3,723,019
72 3,723,020
147 3,723,021
175 3,723,022

CLASS 416

219 3,723,023

CLASS 417

286 3,723,026
299 3,723,025
313 3,723,027
356 3,723,028
420 3,723,029
475 3,723,030

CLASS 418

15 3,723,031
61 3,723,032
159 3,723,024
173 3,723,033
268 3,723,034

CLASS 423

11 3,723,594
50 3,723,595
175 3,722,867
200 3,723,597
244 3,723,598
263 3,723,599
3,723,600
297 3,723,601
305 3,723,602
307R 3,723,603
307 3,723,074
321 3,723,606
322 3,723,608
366 3,723,604
430 3,723,596
447 3,723,605
3,723,607
3,723,609
3,723,610
495 3,723,075
607 3,723,611

CLASS 424

1 3,723,612
7 3,723,613
15 3,723,614
18 3,723,615
47 3,723,616
180 3,723,617
225 3,723,618
248 3,723,619
250 3,723,620
266 3,723,623
267 3,723,621
269 3,723,622
300 3,723,624
301 3,723,625
311 3,723,626
321 3,723,627
324 3,723,628
342 3,723,629

CLASS 425

71 3,723,035
129 3,723,036
139 3,723,037
192 3,723,038
204 3,722,398
3,723,039
245 3,723,040
262 3,723,041
331 3,723,042
393 3,723,043
435 3,723,044

CLASS 431

18 3,723,045
3,723,046
76 3,723,047
151 3,723,048
183 3,723,049
191 3,723,050
267 3,723,051
339 3,723,052

CLASS 432

6 3,723,053
175 3,722,866
207 3,723,054

D 2—	247	226,544		189	226,553	D23—	28	226,561			226,569		17	226,577	D72—		226,594
D 6—	34	226,545		264	226,554		48	226,562		15	226,571	D48—	16	226,578	D85—	2	226,584
	192	226,546		278	226,555		94	226,563			226,572		27	226,580	D86—	8	226,585
	252	226,547	D04—	5	226,570	D26—	1	226,564	D36—	8	226,573			226,581		10	226,586
D 8—	58	226,548	D13—	1	226,556		5	226,565	D40—	1	226,574		31	226,582			226,587
	61	226,549	D14—	3	226,557			226,566			226,575	D52—	2	226,591	D87—		226,588
	181	226,550			226,558		14	226,567	D44—		226,576			226,592	D90—	16	226,589
D 9—	44	226,551		6	226,559	D33—	1	226,583	D45—	16	226,579	D57—	1	226,593	D95—	3	226,590
	117	226,552	D22—	7	226,560	D34—	5	226,568									

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

29—	470.3	T908,002	117—	119.6	T908,010		453	T908,004			521	T908,009	264—	109	T908,008	424—	273	T908,005
40—	106.1	T908,006	260—	74	T908,011		486R	T908,001			615A	T908,003		209	T908,007			

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 3,722,067	3,722,345	3,722,812	3,723,450	3,723,927	3,723,341
3,722,498	3,722,346	3,722,813	3,723,462	3,723,928	3,723,345
3,723,065	3,722,355	3,722,816	3,723,467	3,723,937	3,723,364
2 : 3,722,323	3,722,360	3,722,840	3,723,474	3,723,938	3,723,373
3,723,534	3,722,366	3,722,847	3,723,501	3,723,958	3,723,374
4 : 3,723,201	3,722,374	3,722,850	3,723,539	3,723,961	3,723,378
3,723,738	3,722,400	3,722,854	3,723,589	3,723,962	3,723,379
3,723,770	3,722,415	3,722,856	3,723,591	3,723,980	3,723,434
3,723,830	3,722,416	3,722,862	3,723,613	3,723,983	3,723,520
3,723,835	3,722,445	3,722,881	3,723,626	3,723,987	3,723,521
3,723,836	3,722,453	3,722,890	3,723,642	8 : 3,722,137	3,723,540
3,723,851	3,722,470	3,722,892	3,723,648	3,722,146	3,723,543
3,723,910	3,722,472	3,722,910	3,723,656	3,722,593	3,723,655
3,723,973	3,722,481	3,722,921	3,723,664	3,722,679	3,723,682
3,723,981	3,722,482	3,722,924	3,723,666	3,722,903	3,723,759
5 : 3,722,297	3,722,483	3,722,929	3,723,668	3,723,036	3,723,815
6 : 3,721,998	3,722,489	3,722,943	3,723,669	3,723,184	3,723,939
3,722,015	3,722,496	3,722,944	3,723,673	3,723,594	3,723,942
3,722,017	3,722,497	3,722,946	3,723,684	3,723,654	3,723,970
3,722,030	3,722,503	3,722,947	3,723,703	3,723,661	10 : 3,722,181
3,722,034	3,722,505	3,722,953	3,723,704	3,723,748	3,722,726
3,722,052	3,722,513	3,722,972	3,723,715	3,723,803	3,723,203
3,722,060	3,722,536	3,722,977	3,723,718	3,723,848	3,723,234
3,722,061	3,722,562	3,722,978	3,723,719	3,723,881	3,723,260
3,722,068	3,722,570	3,722,983	3,723,729	3,723,907	3,723,262
3,722,072	3,722,579	3,722,995	3,723,730	9 : 3,722,090	3,723,317
3,722,081	3,722,582	3,722,996	3,723,733	3,722,123	3,723,348
3,722,083	3,722,584	3,722,997	3,723,742	3,722,148	3,723,387
3,722,084	3,722,602	3,723,010	3,723,743	3,722,212	3,723,397
3,722,085	3,722,605	3,723,025	3,723,745	3,722,351	3,723,436
3,722,096	3,722,616	3,723,045	3,723,755	3,722,358	3,723,470
3,722,097	3,722,652	3,723,096	3,723,756	3,722,399	3,723,500
3,722,117	3,722,664	3,723,098	3,723,758	3,722,403	3,723,504
3,722,122	3,722,667	3,723,101	3,723,766	3,722,469	3,723,505
3,722,142	3,722,671	3,723,102	3,723,769	3,722,534	3,723,568
3,722,149	3,722,676	3,723,136	3,723,773	3,722,538	3,723,569
3,722,158	3,722,687	3,723,210	3,723,779	3,722,675	3,723,570
3,722,160	3,722,695	3,723,214	3,723,780	3,722,693	3,723,573
3,722,163	3,722,713	3,723,229	3,723,798	3,722,725	11 : 3,722,409
3,722,178	3,722,716	3,723,231	3,723,799	3,722,748	3,722,450
3,722,183	3,722,742	3,723,237	3,723,800	3,722,804	3,722,467
3,722,186	3,722,751	3,723,258	3,723,808	3,722,818	12 : 3,722,023
3,722,219	3,722,764	3,723,283	3,723,827	3,722,870	3,722,028
3,722,225	3,722,778	3,723,307	3,723,856	3,722,927	3,722,079
3,722,264	3,722,791	3,723,319	3,723,870	3,722,938	3,722,091
3,722,268	3,722,792	3,723,324	3,723,891	3,722,985	3,722,098
3,722,280	3,722,793	3,723,337	3,723,900	3,722,992	3,722,121
3,722,284	3,722,797	3,723,359	3,723,904	3,723,228	3,722,134
3,722,293	3,722,798	3,723,361	3,723,908	3,723,276	3,722,239
3,722,330	3,722,799	3,723,431	3,723,916	3,723,278	3,722,397
3,722,332	3,722,803	3,723,447	3,723,920	3,723,330	3,722,424

3,722,511
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3,722,698
3,722,789
3,722,841
3,722,882
3,722,908
3,723,133
3,723,321
3,723,380
3,723,687
3,723,868
3,723,963
3,723,982
13 : 3,722,077
3,722,100
3,722,169
3,722,434
3,722,435
3,722,448
3,722,514
3,722,626
3,722,706
3,722,766
3,722,905
3,722,945
14 : 3,722,254
3,722,303
15 : 3,722,941
16 : 3,722,508
3,723,230
17 : 3,721,999
3,722,010
3,722,021
3,722,043
3,722,050
3,722,057
3,722,062
3,722,070
3,722,102
3,722,112
3,722,114
3,722,119
3,722,155
3,722,162
3,722,167
3,722,168
3,722,200
3,722,205
3,722,209
3,722,213
3,722,217
3,722,227
3,722,232
3,722,248
3,722,292
3,722,298
3,722,304
3,722,310
3,722,312
3,722,324
3,722,336
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3,722,509
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3,722,618
3,722,642
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3,722,702
3,722,708
3,722,719
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3,722,724
3,722,741
3,722,745
3,722,750
3,722,771
3,722,782
3,722,786
3,722,790
3,722,820
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3,722,864
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3,722,896
3,722,916
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3,723,021
3,723,022
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3,723,043
3,723,072
3,723,078
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3,723,131
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3,723,294
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3,723,303
3,723,306
3,723,310
3,723,316
3,723,368
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3,723,407
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3,723,473
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3,723,552
3,723,554
3,723,556
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3,723,560
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3,723,579
3,723,602
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3,723,647
3,723,662
3,723,689
3,723,702
3,723,724
3,723,725
3,723,735
3,723,736
3,723,741
3,723,785
3,723,857
3,723,882
3,723,906
3,723,915
3,723,919
3,723,929
3,723,949
3,723,964
3,723,989
18 : 3,722,037
3,722,063
3,722,127
3,722,151
3,722,314
3,722,477
3,722,537
3,722,668
3,722,727
3,722,835
3,722,889
3,722,897
3,722,920
3,722,928
3,722,974
3,723,132
3,723,465
3,723,546
3,723,627
3,723,850
3,723,944
19 : 3,722,031
3,722,164
3,722,182
3,722,197
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DESIGN PATENTS

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10 : T908,011
17 : T908,002
26 : T908,003
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36 : T908,006
42 : T908,007
T908,005
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T908,009
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Frederick B. Dent, Secretary

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Robert Gottschalk, Commissioner